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Regional Trade and Growth in Asia and Latin America: the importance of Productive Complementarity

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The views expressed in this work are those of the author and do not necessary correspond to the official position of the institutions involved

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I – Introduction

Latin America faces a peculiar situation. Its rich endowment in natural resources has provided substantive gains stemming from recent boom in the international prices of most commodities. Forecasts for the coming decades are convergent in that this favorable situation is likely to remain, thanks to the perspectives of demand, mainly by Asian emerging economies. As a matter of fact, some Asian countries now rank among the main trade partners for a number of Latin American countries.

At the same time that the geography of trade flows has changed substantially, the actual inflow of foreign resources and the perspectives of massive future inflows of resources have put pressure on the real exchange rate of most countries, thus affecting competitiveness of some sectors, manufactures in particular. Furthermore, Latin American producers face an increasing competition of Asian products, both in their domestic markets and in other, traditional export markets.

This scenario poses several challenges. The alternative of improving the domestic conditions to maximize the benefits from the exploitation of natural resources is essentially an option for each country individually, and implies a number of macroeconomic issues and political economy aspects. Bigger economies have better chances to pursue such route.

An alternative, complementary option is to reinforce regional economic links as a means to increase competitiveness, as observed in Asia. Productive complementarity

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should allow for lower production costs, hence better competitive position for Latin American producers.

This is the departure point of the present work. It assumes that regional trade in Latin America has seldom been based upon clear economic objectives. It has been considered, instead, as synonymous of regional integration, hence dependent upon the signing of formal agreements, often with a more political motivation. It will be argued that the recent Asian experience provides an example and a challenge, which should be taken into account by Latin American countries.

Regional trade links are often taken as synonimous of regional integration. But a policy strategy of intensifying bilateral trade flows does not necessarily comprise differentiated trade concessions. Other policy measures, like the promotion of productive complementarity and the improvement of infrastructure, among others, might have more impact on trade than formal agreements.

The intensification of trade relations with neighboring countries is important for several reasons. There is a wide range of traditional arguments favoring regional integration, and they comprise such different aspects as the enlargement of the domestic markets that allows for gains from scale, geopolitical arguments, stemming from stronger joint negotiating capacity of the participating countries, macro discipline, when trade facilitation is coupled to macro policy coordination, its role as a political signaling to domestic economic agents and several other attributes.

Nevertheless, however important, regional integration is certainly not the panacea that seems to be often expected, if one considers a number of proposals and several political discourses. There are limitations to what can be achieved, there is no universal model to follow and the actual results are a function of the circumstances allowed by the political economy in each case and at each moment in time.

There is also no consensus with regard to the actual effect of regional agreements over the global welfare, nor with regard to the ideal size (number of countries) for a given integration exercise. Evidence would even motivate questions as to the actual importance of formal agreements as an instrument to foster regional trade, since overcoming infrastructure constraints and providing a favorable business environment might be more effective than signing agreements with an increasing number of partners.

It is, therefore, a controversial subject. Notwithstanding the criticism, however, it is hard to not consider this issue as relevant, on the basis of the increasing number of preferential trade agreements signed in recent years in every region of the world, even by countries that have traditionally resisted to this type of policy approach. Furthermore, regional trade is a basic characteristic of the recent trade performance and output growth actually achieved by several countries.

This leads us to the trade-growth relationship. The theoretical literature provides a more clear understanding of the effects of output growth on trade composition than on the (multiple) effects that trade might have on output growth. There is no simple, unique way to conceive this relation. The causality from regional trade on growth is even less immediate. But this is the essence of the present work.

The aim here is to deal empirically with the following hypothesis: to the extent that regional trade comprises a good deal of producer goods, this is likely to have a more significant impact on output growth for the participating countries than in an alternative situation where regional trade is predominantly in final goods.

A second, related hypothesis is that when regional trade in producer goods benefits the production of final goods in one or more of the participating countries, there is likely to occur a 'regional multiplier effect', where derived demand for producer goods provide the resources for the consumption of regionally-produced final goods, and both types of countries (i.e., the producers of intermediate goods and the producers of final goods) gain from regional trade. As a consequence, output growth is likely to become more homogeneous, with higher correlation among the business cycles of the participating countries.

The relevance of isolating the role of producer goods for analysis stem from the two peculiar characteristics of these products: a) the demand for producer goods is a derived demand, hence it is closely linked to the overall activity of the economy and b) even more important, the role of these products in the diffusion of technical progress. Technological changes are embedded in the characteristics of the productive process, so the more intense the involvement of a given economy with the production and commercialization of these products the higher the chances that it will benefit from the opportunities of access to updated technological information.

Castaldi/Dosi (2008)[1] have shown that the rates of growth of GDP are closely correlated with domestic innovative activities, the rates of investment in capital equipment and international technological diffusion. Relating this issue to trade Goh/Olivier (2002)[2] recall that a country which has a comparative advantage in a consumption good, but which gains access to capital goods, is able to accumulate more capital compared to autarky, because this access raises output per worker and thus learning by doing. The interaction with learning by doing makes the impact of capital accumulation on growth a permanent one.

The impact of producer goods is not limited, however, to the access to them. There is a component of technological transfer involved that fosters growth even further. A.T.Goh (2005)[3] recalls that several studies have documented that transnational corporations are actively involved in transferring technology to their suppliers in developing countries. This channel of technology transfer gains importance in view of the international fragmentation of production and the increased flow of FDI into developing countries. Furthermore, empirical studies show that suppliers in developing countries are not passive recipients of technology: long-term buyer-seller relationships are built as the supplier makes technological efforts to complement the knowledge received from the buyer. There are, hence, sound reasons for focusing the attention of the analysis on the trade on producer goods.

One remarkable case comprising intense regional trade relations, high rates of output growth and a significant component of trade in producer goods is found in Asia, in recent years. These characteristics are complemented by a peculiar regional dynamism whereby the traditional important weight of the US and European Union markets has been gradually complemented by trade links growing at a very fast pace between most Asian countries and China, Japan, India and South Korea.

This has (at least) two implications. On the one side, it crystallizes a model of 'hub' countries leading growth on a regional scale and consolidates a structure of production

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[1] C.Castaldi, G.Dosi (2008). Technical Change and Economic Growth: Some Lessons from Secular Patterns and some Conjectures on the Current Impact of ICT Technology. LEM Working Paper Series 2008/01. January. Sant'Anna School of Advanced Studies. Pisa.

[2] A.T.Goh, J.Olivier (2002). Learning by doing, trade in capital goods and growth. Journal of International Economics, 56: 411-444

[3] A-T.Goh (2005). Knowledge diffusion, input supplier's technological effort and technology transfer via vertical relationships. Journal of International Economics, 66: 527-540.See references therein.

involving plants operating in different countries. At the same time, however, this imposes a challenge to countries elsewhere, in that there seems to be clear gains in competitiveness stemming from fragmented production. Import competing sectors should worry about the production costs of not one single country, but instead of the actual costs throughout a whole chain of intermediate productive stages in different countries.

The objects for comparative analysis here are the experiences in Asia and in Latin America in the last two decades. The basic question is to what extent is this model providing benefits to Asian economies in terms of output dynamism and if so to what extent can (or should) Latin American countries emulate a similar experience.

The choice is determined, first, for these being two regions with a major participation of developing economies. Second, during this period the results obtained in the two regions have been quite different, both in terms of trade performance and in terms of rhythm of output growth. Third, the relative importance of intra-regional trade in the two cases is significantly different, with higher indicators in Asia. Fourth, Latin America has for a long time been concerned with efforts to promote regional integration. In a historical sequencing this is probably the third region to present formal preferential trade agreements, after Eastern Europe in the late 1940s and Western Europe in the late 1950s. Yet the multiplicity of agreements has not materialized in regional dynamism. Fifth, one of the arguments used in Latin America to explain the limited share of regional transactions – the lack of potential supply conditions by the smaller economies – loses power when one sees in Asia some economies until recently destroyed by wars becoming in a few years star cases in terms of export performance in manufactured products. Sixth, and very important for the present argument, there are marked differences between the two regions with regard to the actual composition of intra-regional trade flows, with trade in Asia presenting a higher share of manufactures.

The comparison of the two experiences seems to be, therefore, rich in lessons relative to designing regional integration experiments.

It is understood that Latin American achievements with regard to regional trade are not as remarkable as could be expected, in comparison to other regions as well as by taking into account the expectations generated by numerous political speeches. There are many reasons for that. One of them has to do with the very fact that in recent

years the rationale for intensifying regional preferences in Latin America is less identifiable than previously, when rather clear objectives oriented the negotiations towards the promotion of industrialization (1950s and 1960s), the reactivation of idle productive capacity by lack of hard currencies (1980s) or the efficiency gains that would boost competitiveness without inflationary pressure (1990s). It is less clear today what the actual objectives for regional preferences are. Even more in a context where free movement of capital might affect the variation of parities and hence harm the whole process. The point of departure for the present analysis is, therefore, that the recent Asia performance provides a possible direction to orient Latin American efforts: as an example, it shows that regional complementarity might provide more homogeneous output growth among the countries involved; as a competitor, it raises the need for joint efforts to face the increasing challenge of rapidly rising imports of products originating from that region.

We start by presenting an overview of the main features of the theoretical literature on regional integration. As will become clear, that literature has focused more on the welfare gains and on the domestic impact of preferential agreements than on the effects of integration on output growth. This relationship has gained momentum in recent years essentially on the basis of empirical work. There is hardly a systematic theoretical treatment of those links.

This is followed by a sketchy presentation of the relationship between productive complementarity and regional integration, and the actual procedures adopted in this work. The following (fourth) Section presents in a very brief and taxonomic form the expected outcomes in the cases of the two regions. The fifth Section shows the underlying scenario for the analysis of the empirical work, based on a number of indicators that allow for a comparison of the two regions in the two last decades, with regard to i) selected macro indicators, ii) the role of the external sector, iii) trade policy, iv) the composition of output and trade and v) the regional policies related to import tariffs and foreign direct investment. The sixth Section presents the main empirical results of the research with regard to the main characteristics of trade flows in each region, the seventh Section discusses the empirical results related to indications of a relationship between the type of trade flows and the homogeneity of output growth among countries in each region and the last Section highlight some relevant policy recommendations stemming from the analysis of the two experiences reviewed.

II - Regional Trade and Development – An Overview of the Basic Literature

II.1 – A Brief Introduction

Trade theory deals with national units with a single difference – whether each one is capable of affecting international relative prices. Within each category countries are exactly similar. This misses the very departing point of development theory, namely the emphasis in the different specificities, by and large related to per capita income levels.

Low levels of development imply limited productive basis, hence limited capacity to generate savings, to produce foreign currency and therefore limited availability of resources to invest. The area in trade theory that deals more closely with these issues is the theory of protection, in its complementary dimensions of positive theory, normative prescriptions and the political economy of protection. Nevertheless the actual treatment of the effects of trade for output growth is not as exhaustively dealt with as the effects of growth on trade.

For similar reasons, the dimension of development is basically dealt with in an indirect way. It is perhaps more closely considered in the treatment of preferential trade concessions. The use of trade agreements as a complementary tool for stimulating trade and growth is old and has been revived recently.

Orthodox reasoning would argue that there is no first-best argument for maintaining trade barriers, as productive efficiency would be maximized when factors are allocated in accordance to the presumed (static) comparative advantages. Yet there is no totally open economy: the world does not correspond to 'first-best' presumptions. Orthodoxy would also argue that there is no case for trade preferential agreements, since multilateral opening would provide the best price signaling. Yet one sees an increasing number of agreements and an intensification of regional trade flows.

Recent European misfortunes have provoked a few concerns with regard if not to the European Union, at least in relation to the way the common currency was implemented. Opponents of regionalism believe they have a case. At the same time, however, the recent performance of Asian countries is remarkable and calls for specific consideration. The regional dimension seems to be so relevant to the point that it has even motivated countries that were traditionally resistant to preferential

agreements to sign a number of them. Furthermore, these agreements are 'business only' and involve even historic enemies[4].

The objective of this Section is threefold. The next sub-Section presents briefly the basic characteristics of the theory of preferential agreements[5]. As will become clear, the focus of this literature has been more intense in identifying the welfare effects of regional integration than in dealing with its contribution to growth. Next, some relations between discriminatory trade preferences and economic development are discussed. This provides the background for the last sub-Section, dealing with regional trade preferences and output growth.

II.2 - A rapid glance on the debate about gains and losses of preferential agreements

Most of the theoretical literature on preferential agreements considers the existence of a common external tariff to be adopted by participating countries, so most of the analysis of gains and losses is centered on the effects of a custom union.

As the next pages will show, however, a good deal of related works – in particular those dealing with the effects on output growth of discriminatory trade preferences in comparison to multilateral opening – do not depend on the existence of a common external tariff. Instead, they basically compare the dynamism provided by regional trade relations to the stimuli provided by the global market.

The departure point is, of course, the basic analysis by Viner[6] of the effects of a customs union, centered exclusively on the production side. This was questioned by Meade (1955), Gehrels (1956) and Lipsey (1968)[7], according to whom the effects over consumption cannot be disregarded. The analysis should necessarily take into account the response by the consumers to the lower import prices resulting from the

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[4] The recent trade agreement between mainland China and Taiwan being a notorious example.

[5] For the sake of presenting the argument no distinction will be made of integration processes of different 'generations' ('shallow' versus 'deeper' agreements), each one with different implications for development and growth.

[6] J.Viner. The customs union issue. New York: Carnegie Endowment for International Peace, 1950

[7] J.Meade (1955), The theory of customs union. Amsterdam: North-Holland Publishing Company, F. Gehrels (1956). Customs union from a single-country viewpoint. Review of Economic Studies, v. 24, p. 61-64, R. Lipsey (1968), R. The theory of customs unions: a general survey. In: CAVES, R.; JOHNSON, H. (Eds.). Readings in international Economics. Homewood. Illinois: AEA/Irwin,

tariff elimination in trade between partner countries. Lipsey (1957)[8] argued that Viner considered only fixed consumption coefficients and Bhagwati (1971)[9] emphasized that Viner assumed a constant volume of imports the origin of which would merely change from the third country to the partner country.

A union necessarily alters relative prices and in general one could expect that this should lead to some substitution among goods, changing the volume of trade, with higher participation of the consumption of cheaper products. This tends to increase the volume of imports from the partner country and to reduce both the imports from the rest of the world and the consumption of domestically produced goods.

Cooper & Massell (1965)[10] have suggested that the formation of a customs union should ideally take place in two steps, first a non-discriminatory reduction of tariffs for all traded goods and in a second stage the adoption of preferential treatment to the partner country in the union. Their argument was criticized by Wonnacott & Wonnacott (1981)[11]: their analysis assumes that the third country – the rest of the world – would passively accept the definition of the common external tariff.

This allows for the identification of another source of welfare gain from a customs union: it might be not convenient to unilaterally reduce tariffs if this can be used in a negotiating process, in exchange for the reduction of barriers from third countries. As a consequence, the conclusion that a unilateral opening to trade is superior to a (negotiated) adoption of discriminatory set of trade barriers is not granted any more. As a matter of fact, Kemp & Wan (1976)[12] have indicated that there exists an 'optimal tariff' that makes both the participating countries in a customs union as well as the rest of the world in a better position than before, by maintaining the imports of products from the rest of the world at the same level than before the formation of a union.

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[8] R. Lipsey, The theory of customs unions: trade diversion and welfare. Economica, n.24, p. 40-6, 1957

[9] J. Bhagwati (1971), Trade-diverting customs unions and welfare improvement: a clarification. The Economic Journal, v. 81, n. 323, p. 580-587, Sept.

[10] C. Cooper.; B. Massell (1965). Toward a general theory of customs unions for developing countries. Journal o Political Economy, v. 73, n.5, October

[11] P.Wonnacott, Wonnacott (1981). Is unilateral tariff reduction preferable to a custom union? The curious case of the missing foreign tariffs. American Economic Review, v. 71

[12] M.Kemp, H.Wan (1976), An Elementary Proposition Concerning the Formation of Customs Union In: BHAGWATI, J. (Ed.). Selected readings in international trade. Massachussetts, CA.: The MIT Press

A related set of issues has to do with the relation between the pre-union tariffs and the common external tariff to be adopted by the participating countries. In general it can be said that: i) the union will improve resource allocation if the pre-union tariffs were high enough to completely eliminate international trade. In this case there will be pure trade creation and no trade diversion effect and ii) the magnitude of the benefit depends on the differences in costs between the participating countries. The larger these differences the greater the benefits of the union.

What allows a given country to have social gains with the formation of a union is the possibility that there might be benefits to its consumers following the formation of the union, and those benefits can more than compensate the losses obtained in the production side.

In summary, even from a purely static perspective it is not easy to make categorical *a priori* affirmatives with regard to the convenience of forming a customs union. Still other elements, such as changes in the terms of trade can contribute to affect the perception of gain or loss from adhering to a preferential agreement.

II.2.1 - The role of the terms of trade, tariff revenue and other attributes

Most of the theory on discriminatory tariff treatment until the 1960s did not take into account the effects of the creation of a union on the terms of trade, both between the countries forming the union and between them and the rest of the world. Gehrels (1956) did not even consider the possibility of a worsening of the terms of trade following the formation of a union, since the effects over consumption would always be positive, hence welfare improving.

But a discriminatory reduction of barriers affects the terms of trade both in the short and in the long run, via trade diversion, the adjustments in the exchange rate and the changes in productivity and in real income (Balassa (1964)[13]).

With zero tax on consumption the higher the volume of trade among partner countries in relation to transactions with the rest of the world the more probable the positive effects on consumption. Also, the higher the pre-union tariff the bigger the distortion in

[13] B.Balassa (1964). Teoría de la integración económica. México: Unión Tipográfica Editorial Hispano-Americana

consumption, hence the higher the gain from its elimination. And the more competitive the productive structures of the participating countries the more advantageous the substitution of products imported from the rest of the world and hence more intense the positive impacts on consumption[14].

For Kemp (1969)[15] and Kemp/Wan (1976) preferential trade agreements can be seen as building blocks towards the achievement of free trade. There exists a vector of common tariffs that hold international prices constant, therefore trade and the welfare of non-members of the union, at the same level as initially, and independently of the number of countries and goods considered.

Mundell (1964)[16] introduces a new variable, public accounts. The effect of tariffs on prices can be partially compensated by the impact of tariff revenue on total fiscal revenue. A tariff-reducing country will suffer loss of revenue, that has to be compensated by increase in taxes or the reduction in public expenditures. The final result will depend on the way the government adopts to compensate for this loss in prices.

As a consequence it is not possible to infer a priori if the welfare of the tariff-reducing country will improve or worsen, given that there are equilibrium positions that are consistent with both outcomes. Also, some tariff reductions necessarily improve the terms of trade of the countries participating in the union *vis-a-vis* the rest of the world. This is so when those countries reduce tariffs in a way that preserves their intra-union terms of trade at the original level.

This leads to some generic affirmatives (Mundell (1964)): 1 – a discriminatory tariff reduction by a given country improves the terms of trade of its partner in relation both to the tariff-reducing country as well as in relation to the rest of the world, but the terms of trade of the tariff-reducing country may improve or worsen in relation to the rest of the world; 2 – the terms of trade improvement in the partner country will be higher the more intense the tariff reduction. Hence the gains accruing from a free trade area will

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[14] By the same token, the higher the degree of complementarities between domestic production and the products from the rest of the world the lower the probability of these positive effects.
[15] M. Kemp (1969). Some implications of variable returns to scale. Canadian Journal of Economics, v.2, n. 3, p. 403-415.
[16] R. Mundell (1964) Tariff preferences and the terms of trade. Manchester: Manchester School of Economic and Social Studies, n. 32, p.1-13.

be bigger the higher the original tariff level of the partner country; 3 – it is not possible to establish ex-ante the set of tariffs that will improve the terms of trade of the participating countries. It is possible that the terms of trade of one of them worsens in relation to the rest of the world; 4 – the terms of trade of the participating countries as a whole will improve in relation to the rest of the world, because the joint trade balance in relation to the rest of the world will improve, whereas the trade balance of each country individually with the rest of the world will deteriorate and 5 – if there are complementarities between the products of the participating countries and those of the rest of the world there is a possibility that the terms of trade of the rest of the world improve in relation to all the participating countries.

Ffrench-Davis (1979)[17] adds a new component: the power that joint negotiations by participating countries provide in terms of influencing the international market, when the joint imports by those countries account for a significant share of the world production.

For 'non-small' countries if the exchange rate is not fixed the adjustment of terms of trade has further implications (Balassa (1964)). Trade diversion has an immediate impact on the price relation for the union, reducing import prices and increasing export prices. Trade balance is affected and this impacts negatively the currency of a participating country with high pre-union tariffs.

This is a summary presentation of the basic theory of customs union. As seen, it is essentially focused on the effects of a common external tariff on welfare. The next sub-Section introduces a new dimension, by presenting the links between preferential trade and economic development.

II.2.2 – Discriminatory preferences and economic development

Economic development as such has not been explicitly considered in trade theory. The following paragraphs show, however, some aspects that bring the theory of regional integration close to some of the concerns that characterize the literature on development.

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[17] R.Ffrench-Davis (1979). Economía internacional: teorías y políticas para el desarrollo. México: Fondo de Cultura Económica.

The first aspect to consider is that one of the effects of regional integration is, of course, the re-location of production. Secondly, there are 'non-economic' arguments associated to social objectives which stem from the high value given by economic agents - in the countries participating in an integration exercise – to the development of specific productive sectors, manufacturing in particular.

For instance, H.Johnson (1965)[18] considers that given the existence of 'non-economic' objectives the adhesion to a union is a rational way of reducing or eliminating divergences between private and social costs: in view of the preference for some sector (manufacturing) the government will raise protection to the point where the 'collective marginal utility derived from the collective consumption of domestic industrial activity' will be equal to the excess private marginal cost of production in the industrial sector. A discriminatory tariff reduction allows a given country to provide to its partner an increase in its exports and in its industrial production without losing its own industrial production, by means of the diversion of imports from third countries.

According to this view only countries with similar degrees of preference for industrial production will be in a position to benefit from the tariff reduction schemes. It follows that adhering to a union might be attractive to countries with comparative disadvantages in the international market for manufactures.

Meade (1951)[19] argued that a union will lead to an efficient use of resources if formed by economies potentially similar, for in a union with potentially complementary economies there is less chances for trade creation.

C.Cooper/B. Massell (1965)[20] also give emphasis to the social value of industrialization. With tariff and revenue-sharing rules determined in a rational way there will be a tariff that is 'Pareto optimal', leading to welfare and national income levels so that no country can be better off without reducing its partner welfare. An optimal solution requires that each country takes into account the diseconomies generated by its own production, hence some form of compensation should be

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[18] H. Johnson (1965). The economic theory of protectionism, tariff bargaining and the formation of customs unions. Journal of Political Economy, n. 73, p. 256-83.
[19] J. Meade (1951), The removal of trade barriers: the regional versus the universal approach, Economica, May
[20] Op.cit

envisaged. It follows that a union can provide gains to all participants, and even more so if combined to subsidies and comparable compensatory policies.

This of course leads to the issue of the mechanisms for redistributing the revenue following the common external tariff. According to Bhagwati/ Panagariya (1996)[21] even if trade creation surpasses trade diversion an individual country might lose, in view of the adverse effects associated to the distribution of tariff revenue. This redistribution follows from the changes in the terms of trade within the union. When a country reduces its tariffs on the imports from a partner country without reducing the barriers on imports from third countries the terms of trade change in favor of the partner country. The extension of the loss for the tariff-reducing country will depend on the degree of preferential access to market granted to the partner in comparison to the preferences actually received.

Taking into account the possibilities of compensatory mechanisms and in a model of reference with three countries it can be said that: i) countries that do not belong to the union might be not affected, if the imports of their products are maintained at the same or comparable levels as before the union; ii) a participating country may gain in welfare if the loss in terms of tariff revenue is less than the gains that accrue to producers and consumers and iii) in a model of union with two countries and tariff reduction in one of them there will necessarily be welfare gains to the second one, as its exports to the partner country will increase.

Also, relaxing the condition of horizontal supply curve allows for the identification of the effects on relative prices stemming from a discriminatory tariff and the changes in trade flows, as it takes into account the actual cost conditions and the process of price formation (Heffernan/Sinclair (2004)[22], Pomfret (1997)). A union between countries A and B will provoke losses on the rest of the world and the union will certainly have gains. But the net outcome in terms of universal welfare will depend on the losses in the rest of the world surpassing or being lessen than the gains in countries A and B. It follows, of course, that the joint operation of countries A and B in the international

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[21] J. Bhagwati, A Panagaryia (1996), Preferential trading areas and multilateralism: strangers, friends or foes? In J. Bhagwati, A Panagaryia (Orgs.). The economics of preferential trade agreements. Washington, D.C.: American Enterprise Institute Press, p. 1- 78

[22] S. Heffernan, P. Sinclair (1990), Modern international economics, Oxford: Basil Blackwell Ltd.

market provides them with a negotiating capacity that surpasses the sum of their individual capacities.

Corden (1972)[23] pioneered the analysis of economies of scale in the formation of customs union. Assuming economies of scale internal to the firm, from the moment a union is formed one of the countries will dominate the joint market, eliminating production in the other. Total costs will be reduced, due to specialization. The losses for the partner country will be equal to the loss of tariff revenue on the products originally imported from the rest of the world.

This model contributes to seeing the formation of a customs union as an opportunity to exploit lower production costs. The logic of regional preferences becomes associated to the reciprocal exchange of concessions in those sectors with economies of scale or where the expansion of intra-industrial trade leads to lower adjustment costs.

These arguments look particularly suitable to explain the good will of smaller countries to join customs unions (Devlin/Giordano (2004)[24]). One of the risks a country incurs in joining a union is, therefore, the possibility that it be forced into changing its productive resources from sectors with increasing returns to other sectors, producers of items demanded by the partner country, but where production takes place with constant costs.

But integration processes might comprise also costs, and not only benefits. According to Devlin & Ffrench-Davis (1998)[25] among the most common costs are: i) preferences among participating countries might divert trade flows from efficient firms localized in third countries that do not belong to the union, eventually affecting the efficiency of these firms; ii) integration agreements may improve terms of trade among participant countries, at the cost of third countries, thus stimulating the preference margins and barriers in relation to the rest of the world; iii) with asymmetry in tariff levels of the participating countries before the union the loss of fiscal revenue following the

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[23] M. Corden (1972), Economies of scale and customs union theory. Journal of Political Economy, n. 80, p. 465-72.

[24] R. Devlin, P. Giordano (2004) The old and new regionalism: benefits, costs and implications for the FTAA. In: A Estevadeordal. et al. Integrating the Americas – FTAA and beyond. Cambridge, MA: Harvard University Press, p. 143-86.

[25] R. Devlin, R. Ffrench-Davis (1998), Towards an evaluation of regional integration in Latin America in the 1990s. In: TEUNISSEN, J. (Org.). Regional integration and multilateral cooperation in the global economy. The Hague: FONDAD.

liberalization process can have significant perverse distributive effects; iv) an integration scheme may attract foreign direct investment at the expense of other countries whose economies would be more attractive under free-trade; v) the benefits of integration are often distributed asymmetrically among participating countries and tend to be concentrated in some countries; vi) the proliferation of preferential agreements implies administrative costs due to their superimposition, gives margin to 'rent-seeking' behavior and makes it more difficult to identify gains among countries; vii) preferential agreements generate defensive reaction by third countries, leading a given country to adhere not because it is the best option, but because of the potential costs of not participating; viii) regional integration diverts the attention from multilateral negotiations and might eventually reduce the stimulus to a unilateral trade opening.

This leads to the discussion about the adequate number of countries to form a union, as well as to the debate about the 'natural partner' to form a union. Results vary when the number of countries changes and there is no consensus with regard to a criterion to identify the optimal number of partners nor the ideal characteristics of the countries that might be candidates to be partners in a union.

Balassa (1964) refers to J.Viner (1960), J. Meade (1951) and J. Tinbergen (1959)[26] as advocating the idea that if the increase in the number of participants does not include countries with economic structures totally different than those of the original participants, the bigger the number of countries participating in a union the less the possibilities for trade diversion.

In theoretical terms the consideration of three or more products and countries has led to a now significant literature (Pomfret (1979)[27], Collier (1979)[28], Lloyd (1982)[29], Bhagwati/Srinivasan (1984)[30], Collier (1985)[31] and others), the details of which do not pertain to the present purposes. In general it can be said that with three or more goods

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[26] J. Tinbergen (1959), Customs unions: Influence of their size on their effect. Amsterdam: New Holland Publishing Co., (Selected Papers).
[27] R. Pomfret (1997), The economics of regional trading arrangements, Oxford: Oxford University Press,
[28] P.Collier (1979), The welfare effects of customs union: an anatomy. The Economic Journal, n. 89, p. 84-95.
[29] P.Lloyd (1982), 3x3 theory of customs unions. Journal of International Economics, n. 12, p. 41-63.
[30] J. Bhagwati, T.N. Srinivasan (1984), Lectures on international trade. Cambridge, MA: The MIT Press.
[31] P. Collier (1985), Commodity aggregation in customs unions. Oxford Economic Papers, n.37, p. 677-682.

it becomes not possible any more to rank the situations in terms of consumption gains. It would be wrong to infer that a union that provokes trade diversion necessarily worsens welfare. With more than one importable good there may be a gain in consumption which – even without production gains – might surpass the loss in terms of trade. Countries that do not belong to a union do not always lose, as they might gain if the union has adverse effects on its participants.

Krugman (1991)[32] discusses the possibility that countries participating in a union might be more protectionists than before the union was formed. If each union looks for adopting its 'optimal external tariff' this might be harmful to international welfare, if the 'optimal' level is higher than the tariff level previous to the union. Also, given the possibility of a union generating trade diversion the ideal number of unions should be equal to one, a global free-trade.

The alternative of having an increasing number of regional agreements brings about the issue of the number of blocks that maximizes global welfare. The possibility that the rest of the world might have a negative impact stemming from the formation of a union calls for the discussion about the establishment of criteria to form such union or to monitor its effects. This leads to the question of there being a 'natural candidate' with which a given country should make efforts to try and form a customs union.

For Summers (1991)[33] agreements signed by economies that already have significant trade among them are (almost by definition) likely to maximize the chances of trade creation and minimizing trade diversion. It follows therefore that increasing the number of regional agreements goes in the right direction of contributing to increase global welfare.

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[32] P. Krugman (1991), Is bilateralism bad?. In: HELPMAN, E.; RAZIN, A. (Orgs.). International trade and trade policy. Cambridge, MA: The MIT Press.

[33] L. Summers (1991), Regionalism and the world trading system. In: FEDERAL RESERVE BANK OF KANSAS CITY (Ed.). Policy Implications of Trade and Currency Zones, Kansas City, MO. p. 295-301.

Regionalism is important also for Krugman (1991a)[34]. From an economic perspective there are potential gains in: i) reducing the distortions in consumption; ii) increasing the size and productive efficiency of oligopolistic markets via economies of scale and iii) improving terms of trade with the rest of the world. From a 'geo-political' dimension regional agreements allow for a higher degree of mutual understanding among likely partners and provide a escape valve for trade creation in moments when multilateral negotiations come to a standstill. Furthermore, regional agreements take place among 'natural partners' and hence the potential for trade diversion is reduced.

Bhagwati (1993)[35] questions the argument of the 'natural candidate' based on the fact that trade takes place more likely among non-neighboring countries, as well as by emphasizing the substitution in consumption effects that accrue from trade with the rest of the world.

For Bhagwati/Panagariya (1996)[36] the criterion of trade volume to identify the 'natural partner' is treacherous: a) to argue that the higher the trade with a neighbor country the lower the margin for trade diversion is to forget that the relevant indicator to infer about the probability of occurring trade diversion is the ratio of imports to local production, the decisive element in determining the gains or losses from a union; b) the trade criterion does not consider the possibility of losses stemming from an unequal distribution of tariff revenue; c) it is wrong to put emphasis in regionalism, as evidence indicates that not for every pair of countries most of their trade takes place with neighbor economies; d) the argument that trade among similar economies is less prone to trade diversion does not consider that comparative advantages change over time differ among regions.

Venables (2003)[37] argues further that North-South agreements provide higher benefits than South-South schemes. He accepts that regional integration schemes facilitate the appropriation of gains from production in large scale but the opportunities for trade

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[34] P. Krugman (1991a), The move toward free trade zones. In: FEDERAL RESERVE BANK OF KANSAS. Policy implications of trade and currency zones. Kansas City, Mo.: Federal Reserve Bank of Kansas City, p. 7-42

[35] J. Bhagwati (1993), Regionalism and multilateralism: an overview. In: MELO, J. de.; PANAGARIYA, A. New dimensions in regional Integration. Cambridge: Cambridge University Press.

[36] J. Bhagwati, A Panagaryia (1996), op.cit

[37] A Venables (2003), Winners and Losers from Regional Integration Agreements, Economic Journal, vol. 113(490): 747-61

among developing economies are limited and preferential agreements will tend to benefit the larger economies in each group of developing countries. North-South agreements also make it easier to developing countries to participate in global productive structures, benefitting from technology transfer, attracting foreign investment and other benefits.

The literature on economic development often stresses the difficulties in adopting the orthodox economic reasoning to the peculiar characteristics of developing countries. Basic assumptions do not always hold. International trade theory is no exception; but its chapters on preferential agreements have been over time a source of inspiration to those who advocate for the need of a differentiated rationale for the links between regional preferences and economic dynamism of developing economies. Several authors have stressed some aspects of the formation of customs unions that are compatible with the essential logic of development theory.

For Meade (1955)[38] and Lipsey (1957) a union that diverts trade might improve the welfare if price reduction to consumers more than compensates the costs associated with trade diversion. Kemp & Wan (1976) have shown that regional agreements can improve welfare levels.

For Helpman&Krugman (1989)[39] a union increases the probability of developing intra-industry trade, with the consequent improvement of welfare to consumers, stemming from the higher diversity of products. Also, improved competition conditions reduces the market power of firms and hence the margins for welfare-reducing price discrimination strategies.

Linder (1961)[40] explicitly considers a union involving developing economies as a useful tool to foster growth, as it assures efficient allocation of resources, allows for the adoption of measures to deal with balance of payments disequilibria, among others the barriers on imports from developed countries of non-producer goods.

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[38] J. Meade (1955), The theory of customs union. Amsterdam: North-Holland Publishing Company.
[39] E Helpman, P. Krugman (1989) Trade policy and market structure. Cambridge, MA: MIT Press.
[40] S.B. Linder (1961), An Essay on Trade and Transformation, Almquist and Wicksell, Uppsala

In Latin America since the late 1940s ECLAC (for instance, ECLAC (1994)[41]) has advocated the importance of special trade regimes designed to comprise productive complementarities on a regional level, yet remaining compatible with multilateral regimes. The approximation of similar economies might have important consequences as a tool to overcome the limitations imposed by the limited degree of economic development. Even small economies might gain by exploiting the advantages that accrue from the absorption of scale economies.

Regional integration might also be seen as an anti-cyclical tool, as it allows the participating economies to recuperate dynamism during periods of reduced economic activity, by stimulating the use of idle productive capacity (Furtado (2000))[42].

Furthermore, if countries have trade structures that are similar to that of the rest of the world none of them can individually affect its terms of trade. If a number of countries act together, however, adopting tariffs and export taxes, they might have market power to force third countries to reduce their own barriers, thus improving global welfare.

From the perspective of economic and social development, therefore, regional integration (Ffrench-Davis (1979)): i) improves the access to external markets for products that face barriers in developed countries; ii) a number of goods can only be produced in large scale. If a condition to enter third markets is to jump over barriers the possibility of having easier access to other developing markets provides the conditions for absorbing economies of scale, making viable the production of a spectrum of those goods; iii) regional integration facilitates the 'learning' process by smaller economies that start to exploit international markets. Bigger production and exports provide the basis for further diversifying the markets for exports; iv) joint action by a number of countries provides them with a stronger negotiating tool; v) regional integration allows for a higher degree of development and hence higher political independence and vi) since market prices are less important than the social cost of production regional agreements help to reduce the social cost of maintaining idle equipment and generating scarce jobs

In dynamic terms Balassa (1964) adds: a) the improvement in the degree of competition, by exposing domestic firms to products imported from the partner

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[41] ECLAC (1994), Open regionalism in Latin America and the Caribbean. Santiago, Chile.
[42] C. Furtado (2000). Teoria e política do desenvolvimento econômico. São Paulo: Paz e Terra.

countries; b) higher competition following the formation of a union stimulates R&D activities and creates a favorable environment to technical progress; c) improved opportunities stimulate investment both at the regional level as well as from the rest of the world; d) the elimination of trade barriers reduces the administrative procedures, hence there is a lower cost in terms of public expenditures and gains in efficiency.

Devlin/Giordano (2994)) contribute with still another argument regarding the joint production of public goods. With budget constraints developing countries might find in regional agreements a more efficient tool for the creation of regional public goods.

Sub-section II.2 has shown that the theoretical discussion about regional agreements focuses in the identification of gains and losses. This Sub-section presented some of the efforts to link this literature to the concerns of economic development. These issues will be reconsidered in Section V, after we present a set of indicators relative to the Asian and Latin American economies. There we will discuss which of the aspects considered in sub-Sections II.2.1 and II.2.2 apply more explicitly to Asia and Latin America.

Sub-section II.3 will show that the theory on regional agreements offers even less guidance for explaining the contribution of preferential trade to output growth. The literature has a predominantly empirical origin. This empirical characteristic determines that most studies be focused in the cases of the European Union, the oldest and deepest experiment of regional integration and – given the remarkable Asian performance in recent years – in the analysis of the Asian countries.

It is worth noting, furthermore, that another difference from the standard literature on trade preferences is that the works that try to isolate the actual role of regional trade to output growth do not differentiate among types of agreements, whether with common external tariffs or not. They essentially compare the dynamism stemming from regional transactions with global trade.

II.3 - Regional trade preferences and output growth

II.3.1 – Some generic evidence

The theoretical literature on differentiated trade preferences is not very helpful for the discussion of the effects on growth, given its focus on the welfare effects of such

preferences. This has led several authors to try and identify the actual contribution of preferential agreements to growth via 'ad hoc' procedures. Early studies would conceive regional agreements as dummy variables in growth equations, as if the very signing of an agreement could be a sufficient condition to foster growth. It goes without saying that several other conditions, such as macro policies, the contribution of institutions, the actual trade relations of each economy and many others have to be taken into account.

This sub-Section presents a brief survey of a number of empirical works on the links between regionalism and output growth. The basic question is whether one can expect more dynamism stemming from closer regional links or whether more intense multilateral relations (opening up the economy on a multilateral basis) is what affects growth more intensely.

The outcome is mixed. Some analyses[43] find that convergence takes place faster within regions as compared with the world economy, so the gap between less open and more open economies tends to close faster within given regions rather than across the global economy.

Theory (and common sense) indicates that the chances for trade creation are bigger the larger the joint market of participating economies. Hence the chances for regional trade to foster output growth will be more significant for larger markets than for a joint set of small economies[44]. In this sense the findings by Alcala/Ciccone (2003)[45] for European countries, that trade and domestic market size are robust determinants of growth reinforces the hypothesis of 'growth-led exports', instead of an 'export-led growth'. As a corollary, the larger the regional market the higher the probability that it will positively influence the rate of output growth.

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[43] G.Chortareas, T.Pelagidis (2004), Trade Flows: a facet of regionalism or globalization?, Cambridge Journal of Economics, vol.28(2): 253-271, Also, S.Kim and E.Shin (2002), A Longitudinal Analysis of Globalization and Regionalization in International Trade: A Social Network Approach. Social Forces, vol.81 (2): 445-48, *apud* R.Wooster, S.Dube, T.Banda (2007), The Contribution of Intra-Regional and Extra-Regional Trade to Growth: Evidence from the European Union, Globalization and Regional Economic Integration conference, Gyeong Ju, South Korea find that regionalization and globalization are not contradictory processes, and that trade regionalization is trade-creating rather than trade-diverting.

[44] As illustrated, for instance, by the high number of preferential agreements among African countries, with rather limited regional trade.

[45] F. Alcala, A Ciccone (2003), Trade, Extent of the Market and Economic Growth 1960-1996, Journal of Economic Literature, December

Other studies, relying on the Grange-causality type of approach[46] find that intra-regional trade has a lesser impact on growth of output per capita than extra-regional growth. This is reinforced by an alternative type of approach that estimates growth performance for different sets of countries, classifying some as 'open economies', as different from others, who have signed trade preference agreements. Adopting this methodological procedure Vamkakidis (1999)[47] finds that economies grew faster after broad liberalization and slower after participation in an RTA. One problem with this approach is that it departs from the same simplistic view that assumes that a) every regional agreement is equal to any other and b) simply adhering to an agreement should be a sufficient condition to foster growth.

Little guidance from theory increases the difficulty in designing empirical experiments as well as in interpreting their results. Not only do regional agreements differ but the set of countries that participate in each agreement also helps to determine the outcome in terms of output performance.

Regional agreements should stimulate growth and investment, facilitate technology transfer, shift comparative advantage towards high value-added activities, provide credibility to reform programs and induce political stability, although at the risk of at the same time divert trade in inefficient direction and negatively affect the multilateral trade system. Depending on the set countries involved it might turn out that all these effects take place at the same time.

Trying to deal with these questions Gupta/Schiff (1997)[48] discuss the actual impact of an agreement over those countries that do not participate. They find that even an agreement with little economic expression may have market power in certain products, thus leading to the worsening of the terms of trade of the rest of the world.

The question of regional agreements contributing to economic growth has been addressed in terms of the degree of convergence of per capita levels amongst member states and in terms of the relation of the actual relation to the business cycle. The results will depend on a number of variables, such as macro policies adopted by

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[46] Wooster/Dube/Banda (2007), op.cit.
[47] A Vamkakidis (1999), Regional Trade Agreements or Broad Liberalization: Which Path Leads to Faster Growth?', IMF Staff Papers, 46, March: 42-68
[48] A Gupta, M.Schiff (1997), Outsiders and Regional Trade Agreements among Small Countries. The Case of Regional Markets, The World Bank Policy Research Working Paper 1847

each participating country, infrastructure, geographical concentration of supply, product differentiation, the existence of trade barriers (among partner countries as well as imposed by third countries) and others.

It is probably impossible to design an experiment comprising all the possibilities. Venables (2003)[49] contributes with a peculiar perspective, concentrating on the comparative advantages of the participating countries in each trade block. He proposes that countries can be classified in accordance to a spectrum of comparative advantages, and finds that countries with extreme comparative advantage do worse than those with comparative advantage intermediate between the partner and the rest of the world. If comparative advantage is related to income per capita, a union containing high income countries is likely to lead to convergence of per capita incomes, whereas unions essentially comprising developing countries are associated with divergence of per capita incomes.

This type of result is supported by the findings of Berthelon (2004)[50] for whom the agreements between countries in the North have unambiguous growth effects, whereas the effects of initiatives among developing economies depends on the size of its partners. For North-South agreements the evidence is mixed.

Venables proposition is also indirectly supported by Agora/Vamkakidis (2004)[51] who explore the extent to which a country's economic growth is influenced by its trading partner. They find that both industrial countries benefit from trading with developing countries and the latter benefit from trading with the former: the level of foreign income relative to domestic income matters (the ratio of the average per capita GDP of trading partners relative to a country's own per capita GDP is positively correlated with growth).

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[49] A Venables (2003), op.cit.
[50] M.Berthelon (2004), Growth Effects of Regional Integration Agreements, Central Bank of Chile Working Papers No. 278
[51] V.Arora, A Vamkakidis (2004), How Much do Trading Partners Matter for Economic Growth?, IMF Working Paper No. 04/26

The relation between regional factors and the business cycle was studied by Kose/Otrok/Whiteman (2003)[52], for a 60-countries sample. They find that region-specific factors play only a minor role in explaining fluctuations in economic activity.

So far for empirical exercises aiming at identifying generic rules in terms of the actual contribution of regional trade to output growth. The central question is whether the regional market can be a source of demand for locally-produced manufactured exports and even more so for those goods (high-technology products) for which it is expected that production will take place with decreasing costs, stimulating investment in a more intense way, thus contributing most to GDP growth. Presumably, what is taking place in Asia.

Another, related aspect is that in Asia a number of smaller economies in the regions have been 'plugged' to the production processes by means of productive fragmentation and outsourcing[53], but also as a result of 'conscious effort to upgrade the composition of their final exports'[54] .

This leads us to the issue of productive complementarity and regional integration. This is briefly discussed in the next Section, which presents also the basic formulation of the present project.

III - Productive Complementarity and Regional Integration – an Empirical Assessment

Productive processes in an increasing number of industries have in recent years been characterized by the fragmentation of productive stages, with different stages taking place in different countries, mostly in accordance to the difference in costs.

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[52] M Kose, C.Otrok, C. Whiteman (2003) International Business Cycles: World, Region and Country Specific Factors, American Economic Review, vol. 93, No4: 1216-1239

[53] A process known under various names, such as 'slicing the value chain', 'vertical specialization', 'international production sharing', 'outsourcing', 'productive complementarities', among others. This type of operation can of course comprise both arm's length and intra-firm transactions (N.Aminian, K.Fung, H.Iizaka (2007), Foreign Direct Investment, Intra-Regional Trade and Production Sharing in East Asia, RIETI Discussion Paper Series 07-E-064

[54] F.Ng, A.Yeats (2003), Major Trends in East Asia. What Are their Implications for Regional Cooperation and Growth?, World Bank Policy Research Working Paper, 3084

The division of production in isolated units is not a new issue. Multiple stages within a given productive unit or even the combination of processes to get a varied set of finished goods belong to the very logic of productive processes. It is, however, the intensity of the division of processes in different parts of the world that is a new phenomenon.

The concept of a 'regional productive integration' is not something precisely defined neither in the academic literature nor in the business literature. Intuitively it is a process of production physically divided in many units that are linked by a systematic logistic arrangement (Hamaguchi (2010))[55].

As Hamaguchi (2010) emphasizes, the integration of production makes sense when the productive process is composed of units with different intensity of resources: the productivity of a firm should increase by the allocation of each unit to where there is abundance of the resource most intensely used. Hence the gains from fragmentation are larger the more different are the factor endowments in different countries.

The productivity gains stemming from productive fragmentation have to surpass the administrative and logistic costs. If those costs are associated to distance, regional productive integration might be justified. But these gains may also be small, if the endowment of resources is similar among countries in a given region.

In any case, the average cost of fragmentation will be lower if the total output increases as an outcome of scale economies. In this case, a region with a large consumption market, or with a great capacity to export is a natural candidate for regional productive integration.

It is not clear what drives the fragmentation process (Flores (2010))[56]. Whether it is driven by the final producer, exporting labor-intensive activities with cheap technology or repetitive activities, or whether it is the outcome of technological progress, which allows for production to take place in different places at the same time.

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[55] N.Hamaguchi. Integracao Produtiva Regional no Leste da Asia. In Integracao Produtiva – Caminhos para o Mercosul. ABDI. Serie Cadernos da Industria Vol XVI. Brasilia. 2010.

[56] R.Flores. A fragmentacao mundial da producao e comercializacao: conceitos e questoes basicas. In Integracao Produtiva – Caminhos para o Mercosul. ABDI. Serie Cadernos da Industria Vol XVI. Brasilia. 2010.

Whatever the catalyst mechanism, productive fragmentation requires a minimum infrastructural condition (at least transportation and logistics). And the higher the incidence of fragmentation in a given sector the more pressing it becomes for the producers in that sector to adhere to that model: the alternative of remaining out of the fragmentation chain is only sustainable if the producer controls an advanced technology; otherwise its production is very likely to become increasingly non-competitive.

Productive fragmentation corresponds to the difference in costs, hence allows for an efficient allocation of resources. Trade preferences contribute further to reducing costs in the use of goods produced in the participating countries, as they have by definition comparatively better access conditions to the regional market.

The combination of these two elements (the partition of productive processes among various countries, coupled to preferential trade conditions) can provide quite dynamic conditions to compete in the international market.

The available evidence relative to East Asia seems to reinforce this perception.

One characteristic of the intra-Asian trade (East Asia in particular) is that the increase over time in the intraregional trade ratio is mainly due to rapid increases in intra-regional imports, whereas intra-regional exports have been systematically slower[57]. This asymmetry reflects by and large the significant dependency of Asian economies on the exports to third markets, the peculiar composition of the regional export bill[58], at the same time that it is a consequence of the type of economic relationship of China and Japan – the two most important power machines in the region – with the other economies in the region.

This very perception of dynamic (surplus) trade relations with the rest of the world has led to a number of exercises trying to identify whether the high growth these economies have achieved are an outcome of their regional links or follow from their overall trade.

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[57] P.Athukorala, A Kohpaiboon (2009), Intra-Regional Trade in East Asia: The Decoupling Fallacy, Crisis, and Policy Challenges, ADBI Working Paper Series, No. 177, December

[58] Asian countries typically import from the rest of the world natural-resources intensive products and export manufactures, consumer goods in particular.

Ng/Yeats (2003)[59] provide a rather exhaustive analysis of regional trade in East Asia, the most dynamic group of trading countries, with an increasing importance of regional transactions. A good deal of the export dynamism by the smaller economies is provided by demand from Japan and China. Regional countries' export and import profiles have become increasingly complementary over time.

Athukorala (2005)[60] departs from the perspective that international product fragmentation has made East Asian growth dynamism increasingly reliant on extra-regional trade, and finds that extra-regional trade is much more important than intra-regional trade for continued growth dynamism: the process of fragmentation seems to have strengthened the case for a global, rather than a regional approach to trade and investment, as it corresponds to sector production chains.

This is reinforced by the evidence of differentiated intra-industry trade in intra- and extra-regional Asian trade. Zebregs (2004)[61] confirms that the (sharp) increase in intra-industry trade among emerging Asian countries is a reflection of vertical specialization, meaning more trade in intermediate goods. The increased correlation within the region has corresponded to less synchronization with those in the US and European Union.

Shin and Wang (2003)[62] confirm the above perception, in that intra-industry trade is the major channel through which business cycles have become increasingly synchronized among Asian economies. This is not to say that trade by itself increases business cycle coherence: the increased synchronization is an attribute of Asian trade presenting an increasing intra-industry characteristic.

Park/Shin (2009)[63] analyze the effects of intra-regional and extra-regional integration on changes in the pattern of East Asia's business cycle since 1990. In spite of the

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[59] Op.cit.
[60] P.Athukorala (2005), Product Fragmentation and Trade Patterns in East Asia, Asian Economic Papers 4(3): 1-27.
[61] H. Zebregs (2004), International Trade in Emerging Asia, IMF Policy Discussion Paper 04/1
[62] K.Shin, Y.Wang (2003), Trade Integration and Business Cycle Synchronization in East Asia, Discussion Paper 574 (March), Institute of Social and Economic Research, Osaka University

[63] Park, Shin (2009), Economic Integration and Changes in the Business Cycle in East Asia: Is the Region Decoupling from the Rest of the World?, Asian Economic Papers, 8 (1):107-141

proliferation of preferential agreements in recent years, the high degree of trade integration in the region has been driven mainly without governments' deliberate promotion. They find strong evidence that deeper trade integration reinforces output co-movement. Furthermore, they find indication that intra-regional trade integration is also deepening not just through trade of parts and components, but also through trade of final goods.

Even if the positive outcome of recent Asian experience is mostly a result of overall favorable conditions, the very fact that several economies in the region have been able to benefit from these demand stimuli suggest that their capacity to react to these positive signaling stem not only from their open-trade policies: there is a regional, differentiating component to be taken into account. Simultaneity of growth can only take place – with the intensity observed recently in East Asia – where there is productive complementarity. This is what explains the simultaneity of high trade performance and the homogeneity of high rates of output growth.

Alternatively, when a process of trade preferences takes place in a different scenario, with low productive fragmentation, the objective becomes essentially the reduction of formal barriers to trade, with no margin for such multiplier effect. When most of the regional trade flows are finished goods an increase in the exports by one of the countries implies a higher share in the domestic market for these goods in other participating countries; as a consequence, this raises the pressure for the adoption of trade barriers. Instead of a virtuous cycle it is more likely to obtain sudden stops.

This work is a study on productive complementarities and its impact on regional output growth. *Productive complementarity is understood here as reflected in regional trade of products not destined to final consumption*. It is argued that the component of regional trade in producer goods (raw material and intermediate products) has a more significant impact on growth than trade in finished goods.

As conceived, the present approach necessarily considers in each region two types of countries. In regions where there is a good deal of regional trade in producer goods, one group would necessarily comprise the producers of those goods and the other those countries that produce final products, using as inputs the imports from the former countries. In regions where trade is mostly composed of final products larger economies would in principle be the net exporters to the regional market, whereas smaller economies would tend to be less competitive and hence be net importers.

One useful approach for the present purposes is to classify the countries in each region in accordance to their capacity to provide the stimuli to output growth at a regional basis. The reasoning in International Relations (less frequently so in Economics) often uses the classification of 'hub' and 'spoke' countries.

J.Alba/J. Hur/D.Park (2010) define 'hub' and 'spoke' countries as a function of the number of FTA agreements each country has formalized[64]. Because the purpose here is not to deal with regional agreements but instead to make an appraisal of the effects of regional trade on growth, the idea of 'hub' and 'spoke' countries is preserved, but is considered instead in terms of their weight in total regional GDP. A 'hub' country is, therefore, an economy large enough and with significant links with others so that its business cycle might affect the activity in other, neighboring economies.

The approach adopted here has three separate but complementary dimensions:

a. The effects of regional trade in producer goods on output growth of the participating countries
b. The importance of a 'hub-and-spoke' relationship on a regional basis
c. The homogeneity of output growth among participating countries

The basic argument is that the first dimension provides a virtuous cycle where all participants benefit from a given exogenous increase in demand. The existence of a regional 'hub' with significant regional links in producer goods increases the probability that excess demand will be met by regional supply. A more homogeneous output growth process on a regional basis would be an indication that countries benefit in similar extent from variations in demand.

III.1 – Analysis of the characteristics of Regional Trade in each Region

[64] J. Alba, J. Hur, D. Park (2010), Do Hub-and-Spoke Free Trade Agreements Increases Trade? A Panel Data Analysis, ADB Working Paper Series on Regional Economic Integration No. 46, April. According to their definition: let country i have bilateral FTAs with m countries (m > 1) and country j be one of these m countries. Country j is defined as a 'spoke' country if it has bilateral FTAs with m-2 or less countries among the m countries that have bilateral FTAs with country i. Country i is defined as a 'hub' country if it has at least two spokes.

The first step in the comparison of the two regions is to get an overall picturing over time of the trade in the two types of goods considered here – 'producer goods' and 'other products'. This is done via:

i. the estimation of the relative concentration and evolution over time of intra-regional trade in producer goods and 'other goods' – between each pair of countries as well as between each 'spoke' country and the 'hub' countries
ii. the comparison of the results obtained in (i) with the same indicators for trade of each country with the Rest of the World (ROW)

Such picturing is complemented by the estimation of some of the usual indicators used for comparison of intra-regional trade and trade with ROW for both types of products in the two regions. Essentially we estimate for the whole period, and on a yearly basis the following:

i. Herfindahl-Hirschman index of concentration
ii. Intra-industry index
iii. Intra-regional trade intensity index

III.2 – The relationship between the specificities of regional trade and regional output growth

Having identified the characteristics of regional trade in both regions it now remains to verify the relationship between regional trade and output growth. This is done, first, by a brief initial analysis of the degree of convergence (similarity) of GDP growth rates among the countries in each region. For that we use again usual indicators, such as the Herfindahl-Hirschman and the Entropy indexes.

The next step is to analyze the actual significance of regional trade for the homogeneity of output growth rates. This is done by the analysis of the co-movement of the trade and output series by using two instruments:

i. correlation analysis of output series for each country versus the group total and for each 'spoke' country versus each 'hub' country

ii. econometric estimation

The identification of the model to be estimated econometrically is less trivial than the estimation of the indicators listed above. The justification of the actual specification of the model requires some brief account of how this issue has been dealt with in the empirical literature.

III.2.1 - A brief survey of alternative ways of estimating the link between trade and output synchronization

The following is a brief survey presenting a review of five approaches that have been used to study the degree of synchronization of output in specific country sets, with different methodologies and different purposes.

a) Ng (2010) paper on product fragmentation and business-cycle co-movement[65]. uses data from 30 countries to 'examine the effect of bilateral production fragmentation on GDP co-movement by isolating its effect from the impacts of other factors'.

Ng estimates the equation:

$$\rho_{ij} = \alpha_0 + \alpha_1 + BF_{ij} + X_{ij}\,\beta + \varepsilon_{ij} \qquad (1)$$

where ρ_{ij} = bilateral cyclical GDP correlation between countries i and j, BF_{ij} = bilateral product fragmentarion, X_{ij} = vector of other factors and ε_{ij} = disturbance term

Ng selects as candidates for the X_{ij}s the bilateral trade intensity, the bilateral intra-industry trade, the similarity in industrial structure and bilateral financial integration.

ρ_{ij} is the Pearson correlation of cyclical components of annual real GDP between countries i and j over 1970-2004. Ng considers two concepts of bilateral production fragmentation: a) imported inputs embodied in its exported goods as a share of total exports and b) imported inputs embodied in gross outputs as a share of total gross outputs. To correct the endogeneity issues and the unknown form of heterokedasticity Ng uses a GMM-IV estimator.

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[65] E.C.Y.Ng (2010) Product Fragmentation and business-cycle comovement. Journal of International Economics. 82: 1-14.

b) **Moneta/Ruffer (2009)**[66] examine the extent and nature of synchronization of business cycles in Asia (10 countries) for the period 1975:Q1 to 2005: Q3.

The paper uses a parametric dynamic common factor model to examine the business cycle in East Asia and its evolution over time. The basic idea is that common movement in a cross-section of n stationary time series can be captured by k common factors (k < n) unobservable variables influencing the evolution of all series.

The model assumes that the vector Y_t consists of a country-specific autoregressive component of order one, AY_{t-1}, k unobservable factors $Z_t = [Z_{1,t}, \ldots, Z_{kt}]$ common to all the series and an idiosyncratic white noise error term ε_t.

Hence:

$$Y_t = AY_{t-1} + BZ_t + \varepsilon_t$$

$$Z_t = DZ_{t-1} + \mu_t$$

The model is estimated through Kalman filtering, using quarterly, seasonally adjusted, real GDP data. They derive two different measures of synchronization: i) the share of the variance of real GDP growth of each country explained by the dynamics of the common factor, derived from the moving average of the model; ii) simple correlation between the GDP growth rate and the common factor. The model is estimated alternatively with two common factors or with one common factor and two 'area' factors.

c) **Kumakura (2006)**[67] object of analysis is a set of 13 Asia-Pacific economies for 1984-2003. His argument is that the primary determinant of cross-country correlations is not the geographical structure of their export markets but what they produce and export; in the case of Asia, with emphasis to the electronics industry.

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[66] F.Moneta, R. Ruffer (2009). Business cycle synchronization in East Asia. Journal of Asian Economics. 20: 1-12

[67] M. Kumakura (2006). Trade and business cycle co-movements in Asia-Pacific. Journal of Asian Economics 17: 622-645.

The reference model is Frankel and Rose (1998)[68]:

$p(i,j) = \alpha + \beta T(i,j) +$

where T (i,j) measures the bilateral trade intensity and the influence of other variables.

Kumakura uses annual real GDP data, and applies the same model, but with variables T and Z built in a different way. For the estimation of T (i,j) Kumakura makes a distinction between finished products (set A) and raw materials and intermediate goods, according to:

i) holds if (finished goods) and
ii) holds otherwise (raw material and intermediate goods)

T (i,j) is now defined as:

_____ _____

where Y (i) = country i's nominal GDP and = the (adjusted) value of the tradable goods produced in country i and consumed in country m. Kumakura estimates using instrumental variables, to deal with potential endogeneity.

d) Sato and Zhang (2006)[69] check whether there exist long-run co-movements of real output variables among East Asian economies so as to see whether it would be costly for them to adopt fixed parities in some sort of monetary union. Eleven

[68] J.Frankel, A Rose(1998) The endogeneity of the optimum currency criteria. Economic Journal. 108: 1009-1025

[69] K.Sato, Z. Zhang (2006). Real Output Co-movements in East Asia: Any Evidence for a Monetary Union? The World Economy 29:1617-89.

countries are considered and the analysis is based on quarterly GDP data for 1978Q1-2004Q4.

Sato/Zhang first test for stationarity. Then they test whether the variables are co-integrated and examine the long-run and short-run real output co-movements among these economies.

If X_t is a (n x 1) vector of I (1) variables, a VAR formulation becomes:

$X_t = \mu + A_t X_{t-1} + \ldots + A_k X_{t-k} + \varepsilon_t$ where A_i is a (n x n) matrix of parameters

This same equation can be expressed in terms of a vector error-correction form:

$\Delta X_t = \mu + \Upsilon_1 \Delta X_{t-1} + \ldots + \Upsilon \Delta X_{t-k+1} + \Pi X_{t-k} + \varepsilon_t$

Where $\Upsilon_t = -(I - A_1 - \ldots - A_i)$ $(i = 1, \ldots, k-1)$ and $\Pi = -(I - A_1 - \ldots - A_k)$.

Major interest is in matrix $\Pi = \alpha \beta'$, where α= speed of adjustment to disequilibrium and

B' = matrix of long-run coefficients, so that $\beta' X_{t-k}$ represents up to a (n-1) co-integration relationship. The test for co-integration is thus to determine how many $r \leq (n-1)$ co-integration vectors exist in β, what amounts to test whether $\Pi = \alpha \beta'$ has reduced rank.

Tests are made by the statistic $\lambda_{trace} = -T$

where 's are the (n-r) smallest squared canonical correlations of X_{t-1} with respect to ΔX_t , corrected for lagged differences. T = sample size. An alternative test is , using the maximum eigenvalue statistic (test whether there are r co-integrating values against the alternative that r+1 exist).

The test for common business cycles is a test for serial correlation, based on two-stage squares regression using the lagged value of all variables as the instruments.

e) **Rana (2006)**[70] studies whether increased trade and financial integration in East Asia led to greater synchronization of business cycles.

Using annual GDP growth rates for 11 of the ASEAN+3 countries, simple 10-year moving correlations between GDP growth of individual ASEAN+3 members and the group (excluding the individual member) were calculated from 1989 to 2003.

Following Frankel and Rose (1998), the above correlations were recalculated using only the cyclical component of GDP growth. In general, the more synchronized the economic activity within the region, the higher the degree of resilience of regional activity to outside shocks. In order to analyze more formally the relationship between trade intensity and synchronization of economic activity, the following model was estimated:

corr $IP\ (i,j)t = \alpha + \alpha 1\ TI\ (i,\ j)t + \alpha 2$ corr $RI\ (i,\ j)t + \varepsilon ijt$

where corr $IP\ (i,j)t$ refers to the correlation of de-trended industrial production index between country *i* and *j* at time *t*

$TI\ (i,\ j)t$ refers to bilateral trade intensity index between countries *i* and *j* at time *t*

corr $RI\ (i,\ j)t$ is the monetary policy coordination variable defined as bilateral correlation of short-term real interest rate between country *i* and *j* at time *t* .

III.2.2 – The present estimates

The present work focuses on the differences in the contribution of each type of traded product to increasing the homogeneity of output growth within each region. This suggests a formulation (adapting Frankel and Rose (1988)) of the type:

$$\text{corr IP } (i,j)_t = \alpha + \beta\ TINT\_PG_t + \gamma\ TINT\_OG_t + p\ TRADE\_PG_t + \mu\ TRADE\_OGt + \varepsilon_t$$

where

corr IP $(i,j)_t$ = correlation of the GDP growth index between each i ('hub') country and the j ('spoke') countries in period t

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[70] P. Rana (2006), Economic Integration in East Asia: Trends, Prospects and a Possible Roadmap. ADB, Working Paper Series on Regional Economic Integration, No. 2, July

$TINT\_PG_t$ = bilateral trade intensity (in 'producer goods') between countries i ('hub') and j ('spoke') in period t

$TINT\_OG_t$ = bilateral trade intensity (in 'other goods') between countries i ('hub') and j ('spoke') in period t

$TRADE\_PG_t$ = trade of the region with the Rest of the World in 'producer goods' in period t

$TRADE\_OG_t$ = trade of the region with the Rest of the World in 'other goods' in period t

This relation is estimated: i) for the set of 'hubs' and the set of 'spokes' in each region; ii) for each 'hub' individually and all the 'spokes' in each region; iii) for each 'hub' and its likely area of influence, as indicated in the Annex.

This will allow for identifying the relative role of trade in intermediate products and other goods on the synchronization of product cycles and compare, for the two regions, their contribution to more homogeneous output growth.

III.3 – The Basic Information

The trade data used for the calculations here come from the UN/COMTRADE Database, and we have used the SITC Rev.3 classification of products. An 'ad hoc' databank was built. This allowed for the identification of what has been defined here as 'producer goods', as well as the 'other products'. In order to identify the 'producer goods' we have defined a list of items at the 5-digit level (shown in the Annex). This list comprises 1919 positions. For some items the SITC classification is limited to a 4-digit position, and so they have been considered. 'Other goods' are essentially the difference between total trade (in each bilateral trade flow) and the total amount of 'producer goods'.

The period of analysis is 1992-2008[71]. Several Asian countries and some Latin American (mainly Central American) countries do not have information of bilateral trade with other partners at the five digit level in a number of years. There are two possible explanations for that: a) some countries have started to present their trade

[71] The period of analysis is determined to a large extent by the very availability of information in the UN/COMTRADE Database: most countries miss data for 1990-91, according to SITC Rev.3.

statistics according to SITC Rev. 3 after some time, so the initial years of the series are simply not available; b) there was actually no bilateral trade between some given pairs of countries in some years. The latter should be not surprising for a number of smaller Asian countries (in particular those countries with non-market economies) that have only opened their economies to trade by the mid-1990s, but also for trade between, say, some Central American and others, South American countries.

The way we have dealt with this situation was twofold. First we looked for alternative information in the 'partner' countries, for the missing years. This has allowed to fulfilling a number of missing values, after a critical analysis was undertaken, so as to avoid very inadequate figures, given the well-known differences between trade flows as reported by one or the other of the participating countries.

This was not sufficient, however. When no information was available neither from the reporter nor the partner countries the alternative was to consider that there had been no trade in those years, hence the value is zero. This seems to be a reasonable approach, given that on a bilateral basis there is a high probability of no trade relation in some years.

The databank consist of yearly information for each flow of products a) between each pair of countries within each region; b) between each 'spoke' country and each of the 'hub' countries in each region; c) between each country and the rest of the world. The information was so gathered for the so-called set of 'producer goods' as well as for the total bilateral trade and for the 'other goods'.

A second set of data concerned the rates of growth of GDP. These data were obtained directly from the World Bank, World Development Indicators, 2010. Figures at constant 2000 values were used.

III.4 – Identification of a 'Regional Multiplier'

What is being called here the 'regional multiplier' is nothing more than a sequencing whereby in a first moment one 'hub' country imports inputs from one 'spoke' country. This allows for the 'spoke' country, in a second moment, to import final products from the 'hub', and so successively, so that a virtuous process is formed where both countries gain.

Ideally, therefore, the logic of a 'regional multiplier' would call for the analysis of the sequencing between the exports of a 'spoke' country to a 'hub' country and the

subsequent imports by the latter. This could be done with trade data at a monthly or at most a quarterly basis. Nonetheless trade data at the disaggregated level used here are only available on a yearly basis, so the alternative is to rely on the analysis of correlations, as follows.

Let us define some vectors:

.exports of producer goods from spokes to hubs (XSpgH)

.exports of other goods from spokes to hubs (XSogH)

.imports of other goods by spokes from hubs (MSogH)

.imports of other goods from hubs by hubs (MHogH)

.imports of producer goods from hubs by hubs (MHpgH)

.exports of producer goods from spokes to spokes (XSpgS)

.exports of other goods from spokes to spokes (XSogS)

.exports of producer goods by spokes to ROW (XSpgRW)

.exports of other goods by spokes to ROW (XSogRW)

.imports of other goods by spokes from ROW (MSogRW)

.exports of producer goods by hubs to ROW (XHpgRW)

.exports of other goods by hubs to ROW (XHogRW)

Imports of other goods by hubs from ROW (MHogRW)

The analysis is based on the correlation indexes of the annual variations of each of these variables over time. The idea is that the higher the correlation index the closer the variations of two variables. This allows us to identify five possible relations that would characterize significant regional links:

1. It is expected that the correlation between the variations of the exports of producer goods by spoke countries to hubs and the variations of their imports of other goods from the latter should be higher than the correlation between the variations of exports of producer goods from spokes to hubs and the variation of spokes'imports of other goods

from the Rest of the World. This is the most relevant relation as far as the idea of a regional multiplier is concerned: it means that there is no 'leakage' in the process of interaction between spokes and hubs, as reflected in the former imports from other areas. Hence we should obtain:

Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXSpgH. ΔMSogRW)

2. It is expected that the variations of trade between spoke and hub countries in other goods should also be more correlated than the variations of trade of spoke countries with the Rest of the World. Hence we should obtain:

Corr (ΔXSogH. ΔMSogH) > Corr (ΔXSogRW. ΔMogRW)

3. It is expected that the correlation between the variations of the exports of producer goods by spoke countries to hubs and the variations of their imports of other goods from the latter should be higher than the correlation between exports and imports by hub countries in their trade with the Rest of the World. Hence we should obtain:

Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXHogRW. ΔMHogRW)

4. The variations of trade among spoke countries (exchange of producer goods and other goods) should be more closely correlated than the variations of the trade of these countries with the Rest of the World: the exports of producer goods in exchange for other goods should not be as intense in the case of trade with the Rest of the World as with the hub countries. Hence we should obtain:

Corr (ΔXSogS. ΔXSpgS) > Corr (ΔXSpgRW. ΔMSogRW)

5. By similar reasons as in point (4) above, the variations of trade between hub countries (exchange of producer goods and other goods) should be more closely correlated than the variations of the trade of these countries with the Rest of the World. This leads to:

Corr (ΔMHogH. ΔMHpgH) > Corr (ΔXHpgRW. ΔMHogRW)

Needless to say, the stronger condition for the existence of what is called here a 'regional multiplier' is the first of these relations. It is expected that these relations will hold for Asia and not so much for Latin America, as illustrated in the next Section.

IV – Expected Outcomes

IV.1 - Expected Scenario in Asia

Asia in general, and East Asia in particular, presents very unique conditions for regional productive integration (Hamaguchi (2010): i) there are, within the region, a large diversity of economic development conditions, thus providing a spectrum of countries with varied technological intensities, hence allowing for a more defined division of the regional division of labor; ii) not only there has been significant improvement in transportation conditions in the region, but also the very fact that most of the transport of merchandise trade is by sea provides 'external economies' whereby investments in infrastructure aiming at the trade with the US and Europe are also instrumental in facilitating regional trade; iii) several of the firms operating in the region are mainly focused in the external market.

This reinforces the importance of studying the Asian case more closely.

There are four potential candidates for 'hubs' in Asia: China, Japan, India and South Korea, jointly corresponding in 2008 to 85.8% of regional GDP. Their dependency on trade with Developing Asia ranges from 26% (India's imports) to 49% (Japan's exports), according to ADB data.

There are 12 potential 'spokes': Bangladesh, Indonesia, Hong Kong SAR China, Malaysia, Mongolia, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, China, Thailand and Vietnam[72].

The presumed mechanism of a 'regional multiplier' would operate as follows. An (exogenous) increase in the demand for, say, Chinese[73] products increases imports by China manufactured intermediate products made in a regional 'spoke' (country A's), required to support China's productive process.

A's exports to China increase at higher rates than A's exports to the Rest of the World (ROW) (trade with a 'hub' is the dynamic component).

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[72] A smart reader might of course question why the list of Asian countries does not comprise also Brunei Darussalam, Lao and Myanmar, since these countries are among the ten ASEAN members. There is no prejudice whatsoever. The basic reason is essentially empirical, given their limited external trade. The three countries have a good deal of their trade related to border activities with China. But in the case of Brunei over ¾ of its exports are oil and gas, and still incipient garment exports (negatively affected by the elimination of its quota by the US in 2004). Lao is not a WTO member, hence trade policies follow diverse disciplines; its main exports are timber, wood processing, agricultural products and forestry products. In a similar way, Myanmar exports mostly agricultural products, wood, gem stones, fruits and nuts. These countries do not present, therefore, the profile that has characterized most of the Asian trade recently, with an increasing importance of trade in manufactures.

[73] Or any of the other 'hub' countries.

A's export increase fosters A's industrial production and A's income. This allows for an increase, in a subsequent period, of A's imports of final goods from China. This 'spill-over effect' on imports from China takes place with higher intensity than on imports from ROW (due to lower relative costs, consumer preferences and closer trade networks).

As a consequence, China's growth: a) was made viable by the use of regional parts; b) had a 'multiplier effect' on neighboring countries and c) had positive effects on China's own trade balance and re-stimulates a renewed demand for A's products once again, etc.

It is expected that given the productive linkages among Asian countries a similar (although eventually less intense) relationship is found with regard to Japan, India and South Korea. In the case of India it is expected that such relation is probably becoming more intense in recent years with other South Asian countries. It is up to empirical analysis to confirm this hypothesis.

IV.2 - Probable Scenario in Latin America[74]

In Latin America there is hardly a set of mechanisms for monetary and financial cooperation comparable to those found in Asia. Also, the share of intra-regional trade on total trade is smaller and there are differences between the two regions in the product structure of regional trade flows, as well as in the incidence of fragmentation of productive processes[75]. This leads to expectations of a less relevant 'regional multiplier' than in Asia.

According to the criteria adopted here there are three potential 'hubs' in Latin America: Brazil, Mexico and Argentina[76], jointly corresponding in 2008 to 73.6% of total regional GDP. It is known from start that Mexican trade relations are essentially centered in

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[74] This work does not consider the Caribbean countries. This can be justified on the grounds of the heterogeneity of the economies of those countries, the high importance of the service sector as a source of foreign exchange for several of those countries and the special treatment that the exports from several of those countries receive from (mostly European) counterparts, as different from Latin American countries. For similar reasons we do not consider also other small economies such as Belize, French Guyana, Guyana and Suriname.

[75] Apart from other typical Latin American features, such as the remaining barriers on bilateral trade and the political dimension of integration arrangements.

[76] According to UN/ECLAC Trade Databank BADECEL in 2009 Argentina exported to Latin America and the Caribbean 42.3% of its total exports and imported 38.6% of its total imports. The corresponding figures for Brazil are 22.5% and 17.7% respectively, and for Mexico 6,4% and 4.4%, meaning a much limited relationship than in Asia.

North America, so there is no significant expectation about the actual links with other Latin American countries. This is, again, a matter for empirical investigation.

There are 14 potential 'spoke' countries: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela, R.B..

A presumed regional transmission mechanism via trade in Latin America would apparently work as follows. A (exogenous) increase in the demand for say, Brazilian[77] products would stimulate Brazilian GDP growth and an increase in its imports.

As different from the Asian case, however, the direct links between Brazilian productive process and the supply of producer goods by neighboring countries are far less relevant than the links between, say, China and its neighbors, hence the corresponding increase in Brazilian imports might benefit the exports from:

i) neighboring countries, insofar as there is actually demand for the goods they produce

ii) the ROW, for the supply of the producer goods required to sustain the higher level of production as well as to satisfy the excess demand for final goods

If additionally the growth in Brazilian GDP allows for gains from scale and hence boosts Brazilian exports of manufactures to regional 'spoke' countries, this means a higher presence of Brazilian products in the domestic market of those countries and is likely to raise the probability that they will adopt renewed trade barriers.

Given the relevant price/income elasticities (as well as consumer preferences, distribution chains, etc) the effect of growth of Brazilian GDP over imports from ROW is likely to take place more intensely than over exports from 'country LA' - a matter for empirical verification.

The exports by the 'spoke' country to Brazil increase the industrial production in that country and help its trade balance. But as different from the Asian case that 'spoke'

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[77] Or, for that matter, Argentine or Mexican.

country also opts for more intense imports from ROW than from Brazil (to be tested empirically).

As a consequence:

i) the composition of regional trade flows imply a limited space for a regional multiplier effect and

ii) there is a limited chance of a 'second-round effect' of the improved trade balance and the increase in GDP of the 'spoke' country stimulating Brazilian exports[78] and subsequently a second round of Brazil's demand for 'country LA's products

The outcome is that as different from what is expected in Asia, namely a virtuous process where the positive shocks in one economy reflects positively also over other economies in the region, given the composition of trade, in Latin America the above characteristics are more likely to lead to a 'stop-and-go' process of regional trade, with the frequent adoption of barriers to regional trade.

V – The Object of Analysis - A sketch comparison of the two sets of countries

There is already an impressive literature comparing Asia and Latin America, according to several aspects. It is well-known, for instance, that on average Latin American economies lag behind their Asian counterparts with regard to the relative importance of intra-regional trade, in terms of output growth, in terms of savings, in terms of degree of openness to trade, the amount of foreign exchange reserves and other dimensions.

This Section provides a brief comparison of some indicators of the two regions and stresses, in several cases, the situation found in those countries that have been considered here as regional 'hubs' and 'spokes'. This provides the background scenario for the analysis of the quantitative results obtained in the work. The comparison is presented in five blocks of indicators, as follows:

[78] The degree of openness to trade of the Brazilian economy, coupled to the relative diversification of its productive structure also diverts part of the demand stimuli to domestic suppliers, again presumably different from what is observed in Asia.

a) selected macro indicators

The first aspect to consider is the actual level of wealth in each region, as indicated by per capita GDP. Table 1 shows the basic figures.

Table 1 - GDP per capita (current US$) – weighted average 2000-2008 (*)	
Hub countries	
Latin America	6114
Asia	19261
Spoke countries	
Latin America	4911
Asia	9455
Asian 'spoke' countries excluding Hong-Kong, Singapore and Taiwan, China	1969

Source: World Bank, World Development Indicators, 2010 (*) weight: current GDP

It is quite clear that the fact of finding in Asia some of the biggest economies in the world makes the comparison of per capita income unfair in relation to Latin America. At least insofar as the 'hub' countries are concerned. The ratio is of the order of 3:1 between the two regions.

There are also some 'spoke' countries quite rich in that region, hence the ratio of per capita income for 'spoke' countries is 2:1, a bit lower than in the case of the 'hubs', but still an indication of much more opportunities to make business. If we drop three of those 'spoke' countries with exceptionally high income per capita, however, the average Latin American countries would compare quite favorably (2.5 times) with the remaining nine Asian countries.

The basic message from Table 1 is, therefore, that Asia can provide much substantive space for business stemming from the wealth of a number of countries, far above what Latin America can aim at, but it is also a region with pronounced disparities in terms of per capita income among countries. It might be expected therefore, that productive complementarity among the countries in that region should provide a significant stimulus for growth of the smaller economies than is the case in Latin America.

Asia has also shown recently more dynamism than Latin America, in terms of improving its productive capacity. Table 2 shows the average Gross Fixed Capital Formation in the two regions in the last decade.

Table 2 - Gross Fixed Capital Formation (as % of GDP) – average 2000-2008 (*)	
Hub countries	
Latin America	18
Asia	26
Spoke countries	
Latin America	20
Asia	22

Source: World Bank, World Development Indicators, 2010 (*) weight: current GDP

There is a marked difference in the pace of investment among the 'hub' countries in the two regions, with Asian 'hubs' investing a share of their product 1.5 times bigger than their Latin American counterparts.

The Asian rhythm is also more intense in the comparison of 'spoke' countries, but less markedly so. It is also interesting to notice that in Latin America the 'hub' countries had a slower pace of investment in this period than the 'spoke' countries, whereas in Asia the opposite situation applies. Even though the differences are marginal, this should have led – in Latin America – to an increased number of opportunities to trade by the end of the decade, as compared to the initial period.

Part of the reasons why Asian economies have been more dynamic in capital formation is that they commit a lower proportion of income into consumption expenditures, as compared to Latin Americans. Table 3 shows the basic data.

Table 3 - Gross Domestic Savings (as % of GDP) – average 2000-2008 (*)	
Hub countries	
Latin America	20
Asia	31
Spoke countries	
Latin America	24
Asia	29

Source: World Bank, World Development Indicators, 2010 (*) weight: current GDP

For both groups of countries – hubs and spokes – once again the figures for Asia surpass the corresponding indicators for Latin America. But it is interesting to notice also that the lowest commitment to save is found in the Latin American group of 'hub' countries. It is even lower than in the Latin American 'spokes': if in Asia there are higher savings and investment in the 'hubs', in Latin America it is the 'spoke' countries that have saved and invested more.

This higher propensity to consume found in Latin America is very likely associated to the structure of income distribution. As is well known, this region presents one of the highest degrees of income concentration in the world. Although there has been significant improvement in recent years, the degree of concentration remains high. Certainly much higher than in Asia. Table 4 illustrates the point, with data around the year 2005.

Figures for the income share held by the highest 10% are systematically higher in Latin America, with a range of 33.5-45.9, whereas in Asia the corresponding indicator has an interval of 21.7-34.9. There are a number of explanations for the differences in saving rates between the two regions; some of them stress institutional characteristics, others put emphasis on the lack of adequate social security programs and yet others would refer to cultural aspects. It goes beyond the present purposes to provide an explanation.

Suffice to say that it would require a quite high propensity to save (and favorable conditions to invest) to compensate for the fact that 90% of the Latin American population receives only about 60% of the income and hence a relatively limited availability of disposable income.

Table 4 - Income share held by the highest 10% - circa 2005			
Latin America		**Asia**	
Argentina	37.3	Bangladesh	26.6
Bolivia	44.1	China	31.4
Brazil	44.4	Hong Kong SAR, China (f)	34.9
Chile (a)	41.7	India	31.1
Colombia (a)	45.9	Indonesia	32.3
Costa Rica	35.5	Japan (c)	21.7
Ecuador	42.0	Korea, Rep. of (d)	22.5
El Salvador	37.0	Malaysia (b)	28.5
Guatemala (a)	42.4	Mongolia	24.8
Honduras	43.5	Pakistan	26.5
Mexico (a)	37.9	Philippines (a)	33.9
Nicaragua	41.8	Singapore (d)	32.8
Panama (a)	41.4	Sri Lanka (e)	33.3
Paraguay	41.8	Taiwan, China	..
Peru	40.7	Thailand (b)	33.7
Uruguay	33.5	Vietnam (a)	29.8
Venezuela, R.B. de	35.7		

(a) 2006: (b) 2004; (c) 1993; (d) 1998; (e) 2002; (f) 1996
Source: World Bank, World Development Indicators 2010

These four indicators provide a departure point, as they indicate the major differences between the two regions, in terms of trade opportunities – reflected both in per capita income as well as more intense investment – and suggest that a more equitable income distribution might contribute to higher savings and hence higher probability of obtaining a virtuous cycle, via investment.

b) The role of the external sector

The next set of indicators focuses on the actual role of external trade for these economies. This is often measured in terms of the degree of openness of the economies. Table 5 presents some information in this regard. Specific country information is found in the Annex.

Table 5 - Merchandise trade as percentage of GDP – 1990 - 2008					
	1990-99	**2000-08**		**1990-99**	**2000-08**
Latin America (*)	26.4	39.3	Asia (*)	33.5	51.0
Hub countries					
Latin America (*)	23.2	36.8	Asia (*)	21.2	36.1
Spoke countries					
Latin America (*)	37.9	46.8	Asia (*)	106.5	133.6
			Asia without Hong-Kong, Malaysia and Singapore	62.1	81.7

(*) weighted regional average (weight: GDP in current US$ dollars)
Source: World Bank, World Development Indicators 2010

The first point to notice in Table 5 is that both regions have intensified their degree of relationship with the external market between these two periods. In both cases the share of merchandise trade in GDP is higher in 2000-2008 than in the previous decade.

The second aspect worth noticing is that Asian economies are far more open to trade. In Asia the ratio of trade to GDP has remained throughout these two decades some 30% higher than in Latin America. When we group the countries into 'hubs' and 'spokes', however, some surprises show up.

To start with, Latin American 'hubs' are on average more open to trade than the Asian 'hubs'. This has been so in the two decades. Also, 'spoke' countries are more open to trade than the 'hubs'. This is true in both regions, and should not be a surprise, since smaller economies tend to depend more on the external sector than the economies with large domestic markets.

When we compare the indicators for 'spoke' countries in the two regions the usual picturing of a higher degree of openness in Asia stands out. This is true even when the

calculation disregards some atypical cases of Asian countries where trade accounts for more than 100% of their GDP. Even so, the remaining countries are more open to trade than their Latin American counterparts. This is consistent with the findings in Table1, of lower GDP per capita in Asian 'spokes' than in Latin America: smaller economies tend to trade more.

Not surprisingly, this higher dependency on the external market has as one of its consequences an important contribution of the external activities to the generation of income, including government income. This is relevant for the present argument, to the extent that further trade liberation – be it on a preferential or a multilateral basis - imply by definition less tariff revenue stemming from imports. Table 6 illustrates the situation in 2006.

Figures on Table 6 are as a whole consistent with previous information of Asian countries being more dependent on the external market, as the figures are on average much higher than in Latin America. In this latter region the highest indicator is 15.8%, and there are only two cases above 10%. In Asia, differently, the maximum figure is 31% and there are no less than five countries with figures over 10%.

Table 6 - Taxes on international trade as percentage of fiscal revenue(circa 2006)

Latin America		**Asia**	
Argentina (a)	15.8	Bangladesh	30.9
Bolivia	2.1	China	5.1
Brazil	1.9	Hong Kong SAR, China	..
Chile	1.6	India	15.2
Colombia	8.8	Indonesia (a)	3.0
Costa Rica (b)	5.1	Japan (g)	1.2
Ecuador (c)	11.3	Korea, Rep. of	3.3
El Salvador	6.0	Malaysia (h)	5.6
Guatemala	9.6	Mongolia	4.7
Honduras	5.1	Pakistan	13.0
Mexico (d)	4.1	Philippines	20.3
Nicaragua	4.6	Singapore	0.1
Panama (e)	8.6	Sri Lanka	14.6
Paraguay	8.2	Taiwan, China	..
Peru	4.1	Thailand	6.2
Uruguay	5.1	Vietnam	..
Venezuela, R.B. de (f)	4.9		

(a) 2004; (b) 2008; (c) 1994; (d) 2000; (e) 2001; (f) 2005; (g) 1993; (h) 2003
Source; World Bank, World Development Indicators 2010

This reflects, of course, both the degree of trade dependency of each country as well as the actual fiscal policies adopted by each country. Notice that the previous argument of a closer relation of smaller countries with the external demand is not directly applied to the case of fiscal revenue, as some of the highest figures concern quite populous countries, with presumably a large domestic market. This calls for a closer look on the actual trade policy adopted by these countries.

c) Trade policy

For the sake of comparison of the actual degrees of involvement with the external market we need, therefore, additional comparable information with regard to the policies towards the external sector.

One such indicator is the height of import tariffs actually applied by each country. This, of course, does not take into account the myriad of non-trade barriers most countries adopt. But a detailed account of the trade policy surpasses the actual objectives of this work. Table 7 provides some basic figures for comparison. Specific country figures disaggregated at sector level are presented in coming paragraphs and in the Annex.

Table 7 - Tariff rate, applied, weighted mean, all products (%)

	2001	**2007**		**2001**	**2007**
Latin America (*)	12.5	4.4	Asia (*)	6.8	3.7
Hub countries					
Latin America (*)	13.7	3.6	Asia (*)	10.2	4.6
Spoke countries					
Latin America (*)	9.5	6.0	Asia (*)	3.0	2.3

(*) weighted regional averages (weight: total imports)
Source: World Bank, World Development Indicators 2010

There is little surprise in showing that both regions have reduced their fiscal barriers to trade in recent years. If anything, Latin America experienced a far more pronounced reduction, and by 2007 the average tariff rate in the two regions was quite close, around 4%.

The same is true for the groups of regional 'hubs' and 'spokes' in both cases. Once again, figures for Asia are in most cases smaller than for Latin America, but the intensity of reduction in the latter region has been more intense.

It is remarkable to notice in particular the indicator relative to the Latin American 'spoke' countries. It was reduced between the two years, but remains higher than both the average tariff rate adopted by the Latin American 'hubs' and three times higher than the tariffs adopted by the Asian 'spokes'. Latin American countries still have a long way to go in reconsidering their tariff barriers: they remain higher than in the Asian counterparts, even though Latin American economies have, in the last decade, increased their degree of openness and depend less on import tariffs as a source of fiscal revenue.

A complementary indication of the facilities to trade in each region can be obtained from the comparison of the paperwork required for exporting and importing activities. This is not only a 'proxy' for non-tariff barriers on imports, but also an indicator of the facilities provided to traders in each economy at each given moment. Table 8 summarizes some information in this regard. Specific indicators at the country level are presented in the Annex.

Table 8 - Number of documents (*) required for external trading – 2005-2008

	Export		Import	
	2005	**2008**	**2005**	**2008**
Latin America	7.2	7.2	8.4	7.6
Asia	6.9	6.2	9.3	6.4
Hub countries				
Latin America	7.3	7.3	6.3	6.3
Asia	6.3	5.8	9.8	6.5
Spoke countries				
Latin America	7.1	7.2	8.9	7.9
Asia	7.1	6.3	9.1	6.4

Source: World Bank, World Development Indicators 2010

(*) average values, weighted by total export and import values

The procedures to export are easier in Asia than in Latin America, as far as the number of documents required is concerned. Even more, that number has decreased on average in Asia between 2005 and 2008, while no change is detected in Latin America.

A similar picturing is observed with regard to the 'hub' countries in both regions. 'Spoke' countries present, however, a different outcome, with increasing facilitation in Asia, but a light increase in Latin America.

A rather different scenario follows from the import side. Both regions have simplified the procedures to import, reducing the average number of required documents. Once again, the intensity of liberalization in Asia was more pronounced than in Latin America, judging by this indicator. This outcome is confirmed by the indicators for both the 'hub' countries (Latin Americans did not change at all) and the 'spoke' countries, where the reduction of number of documents to import was far more intense in Asia.

Judging from these figures, therefore, it would appear that, in addition to Asia presenting some of the richest economies in the world, higher savings rate and higher investment dynamism, we have: i) Asian economies are overall more open to trade than Latin Americans; ii) Latin American 'hubs' have reduced their tariffs further than the Asian 'hubs'; iii) Latin American 'spokes' remain more protectionist than the regional 'hubs' and the Asian countries in general; iv) both regions have simplified the procedures to import, but the export sector experiences higher administrative barriers in Latin America than in Asia. The relatively higher degree of protection against imports remaining in Latin American 'spoke' countries is certainly an obstacle to fostering regional trade links: the high number of preferential agreements signed among Latin American countries has not materialized in eliminating remaining and in some cases substantive barriers in regional trade.

d) The composition of output and trade

In order to complete this background scenario for the present work it remains to characterize the composition of trade flows in each region. As stated in Section III most of the focus of the present analysis is centered on trade of 'producer goods', which belong mostly to the manufacturing sector. It is convenient, therefore, to have a broad idea of that sector in each group of countries, as well as the characteristics of trade in manufactured products.

Table 9 shows the relative weight of the industrial sector in the productive structure of each region. Country-specific indicators are shown in the Annex.

Table 9 - Value-added in Industry as percentage of GDP – 1990-2008					
	1990-99	**2000-08**		**1990-99**	**2000-08**
Latin America (*)	31.7	32.4	Asia (*)	36.3	35.0
Hub countries					
Latin America (*)	30.7	30.5	Asia (*)	39.7	38.9
Spoke countries					
Latin America (*)	35.3	38.0	Asia (*)	33.3	33.4

(*) weighted regional averages (weight: GDP)
Source: World Bank, World Development Indicators 2010

The two regions show on average quite similar degrees of industrialization. If anything, in Latin America there has been in these two decades a slight increase in the relative weight of industry in total production, in parallel to a small reduction in Asia. Probably the increased importance of the service sector in Asia explains part of this outcome.

The interesting part of this set of indicators follows from the analysis of the 'hubs' and 'spoke' countries. According to Table 9 there has been no significant change in the relative importance of industry neither in the 'hubs' in both regions nor in the Asian 'spokes'. But there was an impressive increase in this indicator for the Latin American 'spokes'. The higher indicators of tariff and non-tariff barriers in Latin America would suggest that a good deal of the increase in the industry/GDP ratio has a component of import substitution. As far as the argument considered in this work is concerned, this by itself should mean increased opportunities for trade in manufactures, hence higher possibilities for regional trade in 'producer' goods. This calls for the analysis of the participation of manufactured goods in the exports of these countries. This is shown in Table10. Country figures are shown in the Annex.

Table 10 - Manufactures exports as percentage of merchandising exports 1990-2008					
	1990-99	**2000-08**		**1990-99**	**2000-08**
Latin America (*)	52.2	54.7	Asia (*)	86.6	86.5
Hub countries					
Latin America (*)	61.5	65.6	Asia (*)	91.2	90.2
Spoke countries					
Latin America (*)	19.4	19.7	Asia (*)	81.4	81.1
Asia without Hong-Kong, Singapore and Taiwan, China				63.8	69.6

(*) weighted regional averages (weight: total export value)
Source: World Bank, World Development Indicators 2010

Table 10 shows that on average the participation of manufactures in Asian merchandise exports is 1.6 times higher than the corresponding figure in Latin America. Comparing the two last decades, there has been a small increase in that participation in the case of Latin America, in parallel to stability in the case of Asia. This is consistent with the previous indicator of an increase of the weight of industry in total value-added in Latin America, and is reflected in the indicators for both 'hub' and 'spoke' countries.

Both Latin American 'hubs' and 'spoke' countries have increased their share of manufactures in total merchandise exports. In spite of the more intense increase in the industry-GDP ratio Latin American 'spoke' countries, the variation in Latin American 'hubs' has been by far more significant. The remaining barriers to trade might be part of the reasons for this outcome.

In general terms here, too, Latin American indicators are much lower than the corresponding Asian results, be it in a regional average, or by the comparison of 'hubs' or the 'spoke' countries, in each region. And this differential remains even when we

drop some Asian countries with extremely high share of manufactured exports. As a matter of fact, the Asian country in this group with the lowest share of manufactures in merchandise exports – Mongolia, with an average percentage in 2000-08 of only 25.2% - surpasses no less than 9 Latin American countries in this indicator.

Both regions have recently experienced also modifications in the geographical orientation of their merchandise trade. Table 11 shows that for these two regions the relative importance of high-income economies was reduced quite significantly between the two decades, both as destination for exports as well as from source of imports. This is most intense in South Asia, but it is true for the three regions/sub-regions considered in the Table.

By and large this movement has corresponded to an increased importance of trade relations with other developing economies. For the three groups of countries in Table 11 there has been an increase in the relative importance of exports and imports to developing economies outside the region. This reinforces the perception of an increasing importance of the so-called 'South-South' trade in recent years. For the Asian countries it has also corresponded to an intensification of intra-regional trade, and quite intensely so in East Asia & Pacific countries. The remarkable aspect to emphasize in Table 11 is that for the Latin American & Caribbean countries there has in fact been in these two decades a reduction of the exports within the region (not so for imports), what only adds to the relevance of a comparative analysis.

In summary, therefore, the countries in Asia and Latin America have become more intensely involved with the external market in recent years, as reflected in the indicators of the contribution of merchandise trade to GDP and the indicators of lower tariffs and less bureaucratic burden for traders. A good deal of this movement reflects an increasing interaction with developing economies outside each of these regions, and less dependence from high-income markets.

Table 11 - The Geographical Orientation of Trade – 1990-2008(percentage of total merchandise trade)					
	1990-99	2000-08		1990-99	2000-08
Exports			**Imports**		
To high-income economies			**From high-income economies**		
East Asia & Pacific	84.6	78.7	East Asia & Pacific	83.0	71.1
Latin America & Caribbean	74.3	72.9	Latin America & Caribbean	76.6	68.0
South Asia	76.8	70.1	South Asia	72.4	55.6
To developing economies within each region			**From developing economies within each region**		
East Asia & Pacific	7.0	10.0	East Asia & Pacific	7.0	13.4
Latin America & Caribbean	17.0	16.0	Latin America & Caribbean	16.3	17.5
South Asia	4.2	5.9	South Asia	3.6	4.5
To developing economies outside the region			**From developing economies outside the region**		
East Asia & Pacific	7.0	10.8	East Asia & Pacific	7.2	12.5
Latin America & Caribbean	5.1	7.8	Latin America & Caribbean	4.7	7.7
South Asia	16.2	21.6	South Asia	12.7	15.2

Source: World Bank, World Development Indicators 2010

One last indicator relevant for the present purposes is the relative participation of products with high-technology intensity in total manufactured exports in each region. Because the central argument for this work is linked to regional trade in producer goods, and a good deal of these products is basically manufactured goods with incorporated technology, such as the electronic components, it is relevant to know what has actually happened to trade in these products in general. Table 12 shows the figures. Country data are presented in the Annex.

Table 12 - High-technology exports as percentage of total manufactured exports – 2000 and 2007					
	2000	**2007**		**2000**	**2007**
Latin America (*)	16.1	11.1	Asia (*)	32.8	28.9
Hub countries					
Latin America (*)	20.1	14.2	Asia (*)	25.9	25.8
Spoke countries					
Latin America (*)	6.8	5.3	Asia (*)	40.6	33.9

(*) weighted regional averages (weight: total export value)
Source: World Bank, World Development Indicators, 2010

Table 12 shows that there was between 2000 and 2007 a reduction in the relative importance of high-technology products among total manufactured exports, and this is true in both regions. Three other features stand out from this Table. First, and as expected, from the indicators shown so far, the percentage of high-technology exports is much higher in general in Asia than in Latin America. In the case of the 'spoke' countries the difference reaches a proportion of 6:1. Second, that percentage remained relatively stable in Asian 'hubs', whereas the reduction has been significant in the Latin American 'hubs'. Third, even when there has been an overall reduction in this indicator (on regional average, as well as for each group of countries), that fall in Latin America has been proportionally more intense than in Asia.

The overall picturing, from the viewpoint of Latin America is, hence, that there has been in the last decade an increase in industrialization, that has taken place with low rate of investment and smaller but still significant barriers to trade, compared to other regions, and this process was more intense in the 'spoke' countries. This has allowed for an increase in the share of manufactures in total exports, but not so for high-technology products, whose relative weight was actually reduced. A good deal of trade performance has been associated to South-South trade outside the region, and the

dynamic component of trade in manufactures has been in products of low and medium-technological content. Very likely, final goods.

e) More on policies towards trade and foreign investment

The literature on recent trade growth in East Asia often stresses three major aspects. A substantive part of the overall performance of these economies is associated to the increase in foreign direct investment, mainly by transnational corporations concerned with reducing production costs. This has motivated significant changes in trade policy by those economies, and as a result a significant component of intra-regional trade reflects the existence of increasingly integrated productive processes, where components are produced in different countries. This is a process that started in the mid-1980s but accelerated since then. Economic integration has been largely market-driven. Table 13 allows for a picturing of what happened to foreign direct investment in Asia and in Latin America. Specific country data are found in the Annex.

Table 13 - FDI Inflow – 1990 - 2008					
Region	**1990-99**	**2000-08**	**Variation**	**FDI as share (%) of GDP**	
	(A)	**(B)**	**(A/B)**	**2004**	**2008**
	Average value (US$ million)		**(%)**		
Latin America	2056	4315	109.9	3.3	4.6
Asia	5054	12011	137.6	4.3	5.8
Hub Countries					
Latin America	8585	17083	99.0	2.8	2.5
Asia	8745	25527	191.9	1.3	1.9
Spoke Countries					
Latin America	657	1474	124.4	3.4	5.1
Asia	3712	7096	91.2	5.4	7.3

Source: World Bank, Trade Division database

Table 13 shows that – in a similar way as in trade – the two regions have increased their links with the international market in recent years. Not only have the actual amount received as foreign direct investment increased in the periods considered but there was also an increase in the weight of the external resources on GDP in both cases. The bigger economies in Asia have attracted a larger amount of resources, but in relative terms this has accounted for a smaller share of total product than in the Latin American hubs.

For the sake of the present work what is remarkable to notice is that the comparison of the 'spoke' countries in the two regions indicates a peculiar outcome. The amount of resources invested in the Asian 'spoke' countries is much higher than in the Latin American ones, although investment in the latter has increased at a much higher rate. This has led to an average rate of FDI/GDP in the Asian 'spoke' countries much higher than observed in any other group. This indicator reinforces the expectation that such a massive inflow of external resources is likely to have had impact on the external trade of these countries.

The second argument associated to the recent growth and trade performance of Asian economies has to do with the intense multilateral opening to trade that took place in those economies. As a matter of fact, the ASEAN4 countries (Indonesia, Malaysia, Philippines, and Thailand) responded to the investors from Japan and other economies in the region by liberalizing their policies towards trade and foreign investment. The massive inflow of investment contributed to the export boom in manufactures. This was followed by a new group of countries that have adopted pro-trade policies, such as Cambodia, Lao People's Democratic Republic, Myanmar, and Viet Nam (Chia (2010)[79]).

Starting in 1992, the ASEAN countries embarked upon a program of trade liberalization, centered on the formation of a free trade zone among the member countries. The initial target of the proposed trade reforms was that countries in the zone were to impose tariffs of no more than 5 per cent on most products traded in the region. Other non-tariff barriers were to be eliminated entirely. At the same time, however, member countries could maintain their own trade regimes against the rest of

[79] Siow Yue Chia. Trade and Investment Policies and Regional Economic Integration in East Asia. ADBI Working Paper Series No. 210 April 2010

the world. Table 14 illustrates the trajectory of MFN tariffs since the early 1990s in Asia and in Latin America.

Table 14 - Weighted average MFN tariffs – 1992 - 2008						
	All products		Manufactures		Primary products	
	1992	2008	1992	2008	1992	2008
Latin America						
Argentina	12.7	5.3	13.7	5.9	5.8	1.3
Bolivia (a)	9.4	4.1	9.3	4.1	10.0	3.3
Brazil	15.7	6.7	20.9	9.3	8.2	1.1
Chile	11.0	1.0	10.9	0.8	11.0	1.4
Colombia	10.6	8.7	10.5	9.4	10.6	7.7
Costa Rica (b)(f)	8.6	3.8	8.0	3.8	10.5	5.1
Ecuador (a)	8.2	5.4	8.4	5.5	6.4	4.2
El Salvador (b)	9.2	3.1	8.7	3.9	10.2	2.4
Guatemala (b)	8.7	3.0	8.1	3.5	10.2	2.4
Honduras (b)	9.0	3.2	7.6	3.1	12.9	3.5
Mexico (b)	7.3	1.9	7.5	2.2	5.7	0.9
Nicaragua (b) (f)	5.6	3.6	4.6	3.4	7.1	3.9
Panama (c)	10.6	7.1	11.0	6.8	9.6	7.9
Paraguay (d)	8.0	3.3	8.1	3.9	7.6	1.1
Peru (a)	16.4	2.1	16.6	2.3	15.8	1.7
Uruguay	5.8	3.6	5.8	4.9	5.8	1.1
Venezuela, R.B.	16.4	11.4	16.7	11.6	14.7	10.0
Asia						
Bangladesh (d) (f)	77.2	11.0	86.9	13.1	55.5	7.3
China	32.2	3.9	36.4	5.8	14.0	2.4
Hong Kong SAR, China	0.0	0.0	0.0	0.0	0.0	0.0
India	27.5	6.1	42.9	5.9	9.2	7.3
Indonesia (a) (f)	12.5	3.6	14.5	4.4	6.0	2.6
Japan	3.9	1.3	2.3	1.6	5.8	1.2
Korea, Rep. of (f)	8.5	7.1	9.9	4.8	6.3	11.6
Malaysia (a) (f)	8.4	3.1	9.1	3.4	4.6	2.3
Mongolia (e)	4.3	5.1	3.7	4.9	5.1	5.4
Pakistan (b)	43.5	9.0	49.6	12.3	36.1	6.3
Philippines	14.7	3.6	14.9	2.7	13.9	5.2
Singapore	0.0	0.0	0.0	0.0	0.0	0.0
Sri Lanka (a) (g)	30.0	7.4	26.6	6.6	43.3	9.2
Taiwan, China	9.1	1.9	10.3	1.9	6.7	2.0
Thailand (g)	35.0	4.6	35.1	5.8	34.5	2.1
Vietnam (d)	21.1	10.6	12.7	11.0	48.0	10.2

(a) 1993; (b) 1995; (c) 1997; (d) 1994; (e) 2005-2008; (f) 2007; (g) 2006/ Source: World Bank, World Development Indicators 2010

Table 14 shows that in Latin America in general the average MFN tariffs in 2008 corresponded to 1/2, 1/3 or a higher proportion of their level in 1992. The most noticeable exceptions are Colombia and Venezuela R.B., with much smaller reduction than other countries, and Chile, with by far the most aggressive open-trade approach in the region.

In Asia, at the same time, with the sole exceptions of Mongolia, with small increases for the period with available information (2005 and 2008) and – even more remarkable – the impressive increase of Korean tariffs on primary products, it can be said that in general the magnitude of tariff reduction in the region was far more intense than what is observed in Latin America. Two of the countries – Hong-Kong and Singapore (the 'city-countries') are totally open to trade, with no tariffs, and in several countries the average tariff level has been reduced to one-fifth or less or the levels observed at the beginning of the period. As an outcome, as shown previously, the average MFN tariff rates applied in the region are much lower than in Latin America.

Active policies towards foreign investment and trade have certainly contributed to the performance of these economies. But in parallel, numerous regional groupings and forums have emerged, giving rise to overlapping groupings of varying geometry. Most of these groupings are centered on ASEAN, which acts as a 'hub' for several initiatives: the AFTA —ASEAN's agreements on trade in goods, AFAS – agreement for trade in services, AIA - ASEAN Investment Area and AEC - ASEAN Economic Community. As in Latin America, there are an increasing number of preferential agreements between ASEAN and other countries, like the ones with China, Japan, Korea, India, Australia-New Zealand, European Union and Gulf Cooperation Council, the so-called ASEAN+3 (ASEAN countries plus China, Japan, and Korea), and the ASEAN+6 (the ten original ASEAN Countries plus China, Japan, South Korea, India, Australia and New Zealand). Other initiatives apart from ASEAN comprise the South Asia Free Trade Agreement, the Trans-Pacific Strategic Economic Partnership, and the Asia Pacific Economic Cooperation forum (APEC).

ASEAN was created in 1967 and focused initially on security and political cooperation. Economic integration objectives were modest until 1992 (even though there existed the Preferential Trading Agreement and some investment cooperation), with the creation of AFTA – ASEAN Free Trade Area and its enlargement to ten country-members. This of course corresponded to the end of the Cold War, what allowed to the adhesion of Vietnam (1995), Lao and Myanmar (1997) and Cambodia (1999), economies that have since the mid-1980s undertaken significant market-oriented policy reforms, liberalizing trade and adopting active investment policies[80].

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[80] Emiko Fukase, Will Martin. Free Trade Area Membership as a Stepping Stone to Development The Case of ASEAN. The World Bank. WDP421. February 2001.

This wave of regional trade preferences has even stimulated changes in the traditional position of some large economies in the region. Until the late 1990s China, Japan and South Korea, the three major economies in East Asia, were the only major economies without regional trade arrangements in the world. In recent years, however, the three countries have signed bilateral/plurilateral trade arrangements with many countries or groups of countries.

China initiated the process, by proposing a Free-Trade Agreement (FTA) with ASEAN, in 2000, which was finally signed in 2004. China also signed a free-trade agreement with Chile the following year and another with Pakistan in 2006.

Japan signed an FTA in January 2002 with Singapore and another in 2004 with Mexico. It also concluded an FTA with several countries, including Malaysia (2005), the Philippines (2006), Chile (2007), Thailand (2007), Brunei Darussalam (2007) and Indonesia (2007), and holds negotiation to conclude FTAs with Australia, India, Indonesia, Korea, Switzerland, Vietnam, ASEAN and the Gulf Countries.

Korea also concluded an FTA with Chile in October 2002, for the first time in its history. Subsequently, Korea signed an FTA with Singapore (2005), EFTA (2005) and ASEAN (2005). Korea also concluded an FTA with the United States in 2007, and has been having formal government-level talks with countries including Japan, the EU, Canada, Mexico and India. (Lee/Koo/Park (2008))[81].

In addition to the multilateral trade opening some Asian countries have also opted for other, active mechanisms of export promotion. For instance, since 1991 Vietnam's industrial and export processing zones have attracted a significant share of total FDI. There are now several such zones, part of them jointly developed by the government and foreign investors. Most of the investment has been in the manufacturing sector, with increasing presence of high value-added sectors.

Vietnam has also adopted since 1992 a Law on Foreign Investment and pro-active policies for the attraction of foreign investors, and has signed agreements on the promotion and protection of investment with more than 40 countries and territorial regions.

These two aspects – a remarkable increase of external direct investment, coupled to a substantial reduction in trade barriers plus active export-promotion policies – make the background scenario for the present analysis.

The Latin American experience is substantially different. Already by the beginning of the 1950s[82] the Central American countries were looking for technical advice by

[81] Hyun-Hoon Lee, Chung Mo Koo and Euijeong Park. Are Exports of China, Japan and Korea Diverted in the Major Regional Trading Blocs? The World Economy (2008), vol. 31, No. 7, pgs 841-860.
[82] That is, even before the signing of the Rome Treaty that created the European Commission in 1957.

UN/ECLAC[83] for the negotiation of a free-trade agreement that might provide an enlargement of their domestic markets and hence the conditions to industrialize. In 1960 a first intent of regional integration was formalized, with the creation of LAIA (Latin American Integration Association), comprising all the South-American countries (except Suriname, Guyana and French Guyana) plus Mexico.

Because the economies were essentially producers of primary products, manufactures had a high positive shadow-price and hence negotiations were carefully designed so as to preserve the bilateral equilibrium in the regional trade in these products. Regional integration was essentially seen as an instrument to make possible large scale industrialization.

In parallel to negotiations in LAIA already in 1969 a first sub-regional group was formed, comprising the Andean countries. This added up to the preferential treatment adopted among Central American countries (since the mid-1950s) and later on, at early-1970s, an additional initiative by the Caribbean countries. To the extent that it is possible to identify basic characteristics of these groupings of countries, perhaps the two most significant are, first, that intra-regional trade has never reached a high proportion of total trade; second, these groups of countries have adopted quite heavy and diversified regional institutionalization, with wide spectrum of objectives, in each case.

At the beginning of the 1990s the Southern Cone countries have created another such mechanism, Mercosur, different from the others in that it is essentially an inter-governmental process. More recently this has been followed by a number of other initiatives of varied composition and different purposes. Nevertheless, regional trade in Latin America remains less important in terms of the total trade of the participating countries, with large variations of that importance over time.

This can be considered as an indication of failure, if compared to the relative weight of regional trade in other regions, like Western Europe, North America and East Asia. Alternatively, it can also be seen as an indication of high dynamism, if one takes into account the actual opportunities of business in each of these regions[84]. Latin America accounts for approximately 6% of global GDP and a similar figure of total trade. Hence having achieved around 20% of total trade might be seen as actually making the most of a limited set of business opportunities. Given the presence of the major economies in the world in North America, Western Europe and East Asia, it should be expected that the number of opportunities in those areas should be much higher than in Latin America.

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[83] The United Nations Economic Commission for Latin America and the Caribbean, created in 1948.
[84] This argument was suggested to me by Ricardo Bielschowsky, from the ECLAC Brasilia Office.

It is beyond the purposes of this work to try and identify exactly what has contributed most to the trade and output growth performance observed in these economies in this period.

As already mentioned, apart from counting with the proximity of some of the largest economies in the world the Asian countries were motivated to create favorable conditions to attract the increasing availability of resources and willingness by large corporations to invest in economies with lower factor costs. Reducing barriers to trade in a moment when the globalization of productive processes was gaining momentum would allow these economies to participate in the productive process of dynamic sectors, such as electronics. The basic argument emphasized here is that this has led to a significant share of regional trade in inputs ('producer goods'), which in turn has provided a number of specific positive effects, among others the convergence of rates of output growth and the existence of a regional multiplier effect.

Latin American economies have for a long time lived with a significant presence of foreign capital. Its richness in natural resources, however, has been a determining factor in attracting predominantly a specific ('resource seeking') type of investment that not always provides productive linkages with the rest of the productive sectors or sustained dynamism in terms of output growth.

This does not mean that there have been no contributions of foreign investors to the industrial sector. As a matter of fact in some countries, like Brazil and Mexico, an important share of the capital installed in the manufacturing sector is of foreign origin. But for the region as a whole a number of countries remain more cautious in their policies towards foreign investors than what seems apparently to be the case in Asia, and – as shown – Latin American economies seem to be less open to external trade.

Furthermore, Latin America being a region with rich endowments of natural resources this has over time determined the pattern of specialization in trade, and most of the region's exports remain concentrated in raw material and final consumer goods.

Taking into account the indicators presented in this Section, how can we view the two regions in accordance to the theoretical treatment presented in Section II? There are (at least) eight dimensions mentioned in Section II that can be considered here: i) the existence of barriers to products from third partners; ii) the redistribution of resources among countries; iii) the existence of trade diversion; iv) the margin for gains from scale; v) the existence of 'non-economic objectives'; vi) the identification of 'natural partners'; vii) the signaling to third countries to join in and viii) geopolitical issues (joint behavior in international forums).

As far as import tariffs are concerned the barriers to the products from the Rest of the World (ROW) are lower in Asia than in Latin America. As a matter of fact there is no

Common External Tariff (CET) in Asia, whereas in Latin American there are different CET structures in Mercosur, in the Andean Community and in the Central American Common Market. Non-tariff barriers are a lot more difficult to measure and to evaluate. This Section has, in any case, shown indications of less paperwork for traders in Asia than in Latin America.

In both regions there are no mechanisms to redistribute – among participating countries - the resources stemming from import revenue or other sources of fiscal revenue. In Latin America, for lack of a corresponding institutional structure; in Asia, for lack of a CET.

The margin for trade diversion in relation to the ROW is considerable and very likely, in both cases. It is probably higher in the Asian case, as indicators have shown that in recent years there has been a gradual change in the ranking of trade partners, with loss of relative importance by the US and European Union and an increasing importance of China and Japan. But because this is the outcome of market forces and specific productive processes, and not induced by explicit trade barriers, this does not correspond to the original concept of trade diversion. In Latin America the existence of various CETs schemes is, of course, a source of trade diversion. But not only in relation to the products from the ROW: there is a significant amount of trade diversion even among different groups of Latin American countries.

The approximation of countries within a region giving margin to gains from scale is more likely in Asia than in Latin America, be it for the sheer importance of regional trade and/or the higher participation of manufactures in regional trade. Even though intra-regional trade in Latin America has a significantly higher share of manufactures than what is found in the trade with the ROW, it is still of relatively limited dimensions.

Both regions have obviously 'non-economic objectives' related to industrialization, in the lines presented in Section II. In Latin America this has been quite explicit over time, with several efforts to use the regional market as a means to provide a broader market for the manufacturing sector. In Asia the objective of fostering industrialization with the help of foreign capital has led – as shown – to intense efforts in terms of opening up the economies and adopting friendly policies towards foreign investors in a relatively short period of time.

If we make reference to Johnson's (1965) words, mentioned in Section II, according to whom if there are 'non-economic objectives' to promote industrialization the government will raise protection, it can be said perhaps that the Latin American countries have corresponded to such prediction, whereas the Asian countries have pursued the same objective with the opposite policy approach, i.e., by reducing the degree of protection to domestic production and to the domestic capital market.

The existence of a 'natural partner' to integrate is also apparently identified with different precision in the two regions. In the case of Asia, the indicators shown here, of an increasing importance of regional trade, coupled to the proximity to some of the richest and most dynamic economies in the world and an already significant and rising degree of production fragmentation among different countries is indicative that for the countries in this region the identification of a 'natural partner' is quite undisputed, at least in the short- to medium-term.

The Latin American perspective is, however, quite different. Clearly the United States and Western Europe are the traditional partners in terms of economic and political matters. Long-standing ties in terms of trade relation as well as investment flows, the sheer importance of these markets and the weight of these economies in the international scenario all make it inevitable that most of the economic and political relations be associated with these countries. At the same time, however, Asia is the new economic frontier, given the dynamism of the largest economies in that continent. The increasing importance of Asian countries as trade partners of several Latin American economies, as well as the increasing presence of Asian investors in the region makes the overall scenario less clear. And a systematic and sustainable approximation among Latin American partners is a challenge in itself, since apart from defensive trade policies there are significant natural barriers to a more intense economic relationship, such as the Amazon jungle and the Andean Mountains.

If geography helps in the case of Asia, where a good deal of recent economic activities have taken place in areas along the coast, hence relying on transportation infrastructure that benefit at the same time trade within the region as well as trade with the industrialized Western economies[85], in Latin America to a great extent this is not so. In South America, in particular, closer links with, say, North America, Europe, or Africa would call for action along the Atlantic coast, whereas trade among neighboring countries would require action in implementing or improving transportation infrastructure in the Western part of the region.

In summary, not only for the reasons indicated by Bhagwati, mentioned in Section II, but also due to other determining factors it has become increasingly difficult for Latin American countries to identify their 'natural partner', as differently from the Asian economies.

Another aspect mentioned in Section II is the actual signaling to other countries to join in a given regional mechanism. In Asia there is little doubt about the validity of this argument, given that the degree of formalization of the preferences is comparatively low (integration is more than anything else made via market) and there are no CETs. In Latin America even though there is a multiplicity of agreements, with different

[85] See, for instance, Hamaguchi (2010) for an analysis of the 'East Asia industrial belt'.

characteristics, in most or all of them there has always been an 'open-door policy' of signaling the good-will to consider applications from third parts. To that extent it can be said that in both regions the approximation of neighboring countries does not exclude the possibility of future adhesions.

Finally, the extent to which the regional integration mechanisms have motivated or induced joint, coordinated action in international forums. Latin American countries have a long history of membership in the main multilateral institutions. Several of them are founding members of these organisms, and have more often than not adopted rather active roles in advocating issues like the differentiated treatment to developing economies. More recently, when negotiations to create what was thought to be the Free Trade Area of the Americas were in place, a new element was formed, in that the Mercosur countries decided to negotiate as a block. Hence, it can be said that yes, in the case of Latin America the efforts to integrate have led in parallel to a new geopolitical position, with concerted action in some opportunities.

In the case of Asia this is less easily identifiable. Not only the political convergence is less likely in many cases, due to historically unsolved problems among countries, but a number of these countries only recently joined in the most relevant multilateral organizations. These controversial relations seem to lie behind the reasons why regional integration has been so successful, based on a 'business only' approach: it would certainly be far more difficult to advance if a political dimension were added. This is not to say, however, that the degree of coordination is zero. Suffice it to mention the debates with regard to the international financial markets: the Asian initiatives in terms of monetary and financial cooperation are often a reference, and the search for regional solutions for financial problems has for some time been a characteristic of the region.

With this background in mind, the next Section presents the results of the empirical analysis.

VI – The Characteristics of Regional and Extra-Regional Trade

As described in Section III a specific database was built for this project, in order to identify the actual role of the 'producer goods'. These were defined in accordance to an 'ad hoc' classification, as indicated in the Annex.

The following paragraphs show the results of the processing of these data in accordance to the methodological approach discussed in previous Sections.

Total trade is, as shown in Section V, far more important in value terms in Asia than in Latin America. But the composition of their trade is quite different: whereas for total goods the proportion of total (regional plus extra-regional) Asian exports to Latin

American exports is a ratio of 5:1, for the exports of producer goods that ratio is 8:1. There is a much higher specialization in the production and trade of those products that transmit technological progress. Table 15 shows the main overall indications.

This difference is mirrored in regional trade. According to Table15 not only the relative importance of regional exports on total exports is higher in Asia (50%) as compared to Latin America (15% in the last decade). The incidence of producer goods is far more important in regional trade in the former region (over half of the exports of these products are destined to the regional market) than in the latter (where this percentage fell to less than 20% in the last decade).

The different magnitudes of trade flows show up also in the import side. Considering the imports coming from the Rest of the World the ratio between the amounts actually imported by the two regions was around 3.8:1 in the last decade. When the types of products are considered, the proportion of producer goods is similar to the total (3.4:1), indicating that on the import side there is no such marked difference as in the export side. Other products (ratio of 4.5:1) are more important for Asian imports. As is well known, these comprise a good deal or commodities.

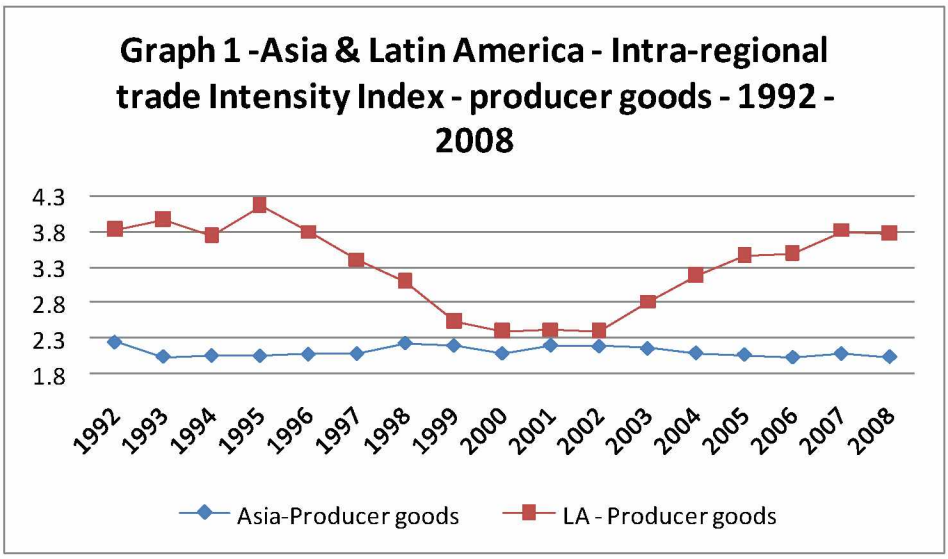
Table 15 - Asia & Latin America - Trade in Producer goods and Other goods - 1992 - 2008

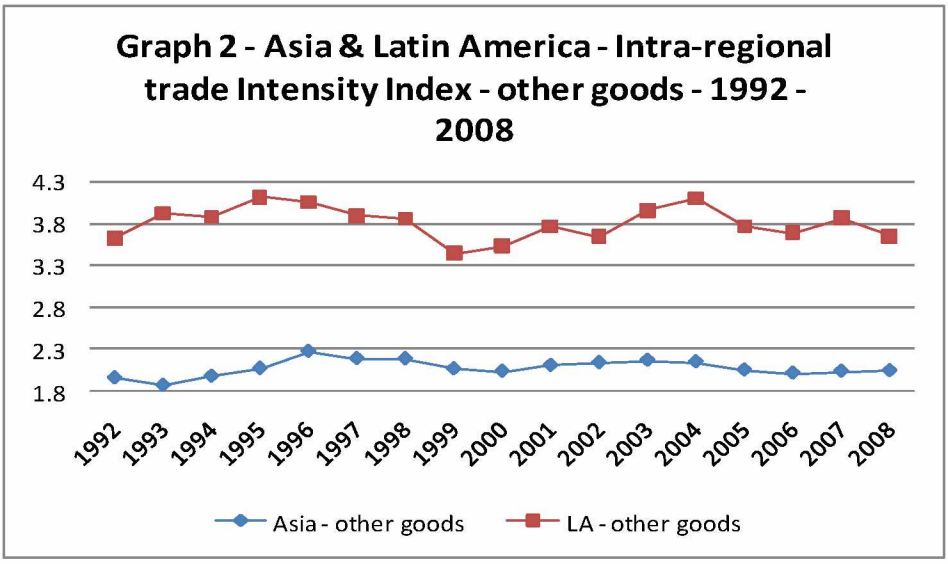
ASIA	Average 1992-1999	Average 2000-2008	LATIN AMERICA	Average 1992-1999	Average 2000-2008
	Amount exported (US$ billion)				
Total goods	1,263	2,691	Total goods	217	507
Producer goods	759	1,625	Producer goods	88	201
Other goods	503	1,066	Other goods	129	305
	Percentage of regional exports				
Total goods	46.5%	49.9%	Total goods	17.8%	15.4%
Producer goods	50.8%	54.8%	Producer goods	20.8%	16.7%
Other goods	40.1%	41.9%	Other goods	15.9%	14.7%
	Amount imported (US$ billion)				
Total goods	1,165	2,435	Total goods	325	634
Producer goods	667	1,312	Producer goods	205	384
Other goods	498	1,123	Other goods	119	249
	Percentage of imports from ROW				
Total goods	49.3%	45.4%	Total goods	61.3%	61.5%
Producer goods	44.1%	35.9%	Producer goods	65.4%	66.7%
Other goods	56.3%	57.4%	Other goods	54.0%	52.9%

Source: own processing of primary data from UN/COMTRADE Database

The fact of the relative importance of regional exports on total exports being higher in Asia can be the outcome of the simple existence of more significant opportunities for

business in one region than in other, which would naturally imply more intense trade relations. A better comparison of the intensity of regional trade is to consider the actual transactions that take place in each region in comparison to what could be expected, given their relative trade flows with the Rest of the World. This is the so-called Trade Intensity Index[86]. Graphs 1 and 2 show the basic indicators.





At least three results are worth stressing, from Graphs 1 and 2.

[86] Intra-regional trade intensity index (ITI) is computed as ITI = [(Xii / (Xiw +Xwi)/2] / [((Xiw + Xwi) /2) /Xww] where Xii is exports of region i to region i; Xww is the total world exports; and Xiw and Xwi are exports of region i to the world and exports of the world to region i respectively. The value of index above (or below) unity indicates the bilateral trade flow that is larger (or smaller) than expected, given the trading partners' importance in the world trade.

First, in both regions the indexes are above unity, which indicates a higher intensity of regional trade than expected, on the basis of the actual presence of both regions in the world market. Second, figures for Asia – both for producer goods and for other goods – have remained around 2.0 over time, indicating a relative stability in this comparative indicator. Third, and perhaps most noticeable, the indicators for Latin America are systematically higher than for Asia, for both types of goods. This is in conformity with the argument presented elsewhere[87], that the actual achievement of regional integration in Latin America can be seen as a big effort, in view of its relatively limited (about 6%) participation in world GDP and world trade, hence the limited opportunities for business within the region. It is remarkable to notice, in any case, that the indicator for intra-regional trade in producer goods in Latin America has had over time a very unstable trayectory, as different from other goods. This apparently reflects the low priority given to trade in these goods in the region.

There are hence marked differences between the two regions, and even more so according to the type of products actually transacted. Table 16 specifies the overall export bill of each region with the Rest of the World, indicating those products that accounted for about half the total value of exports.

The first thing to notice on Table16 is the relative constancy of the export composition of the Asian non-regional exports. In the two sub-periods considered the same sectors were present, with little change in their relative weights in total trade. The same is not true in Latin America. There has been a small reduction in the number of sectors accounting for half of total non-regional exports, indicating an increased concentration. But also a change in its composition, with three sectors – industry special machinery, organic chemicals and metallic manufactures – being replaced by power generating equipment and office/data processing machines.

Of course, these are all items that can be considered as 'producer goods'. So it remains to evaluate separately what has actually happened in each group of products. For that purpose we have estimated some descriptive indicators of the exports in the two regions.The first indicator is the degree of concentration of exports, as reflected by the Export Concentration Index (the so-called Herfindahl-Hirschman Index)[88], comprising all the products from the disaggregated (5-digit) 'ad hoc' database built up for this project. Graphs 3 and 4 illustrate the results.

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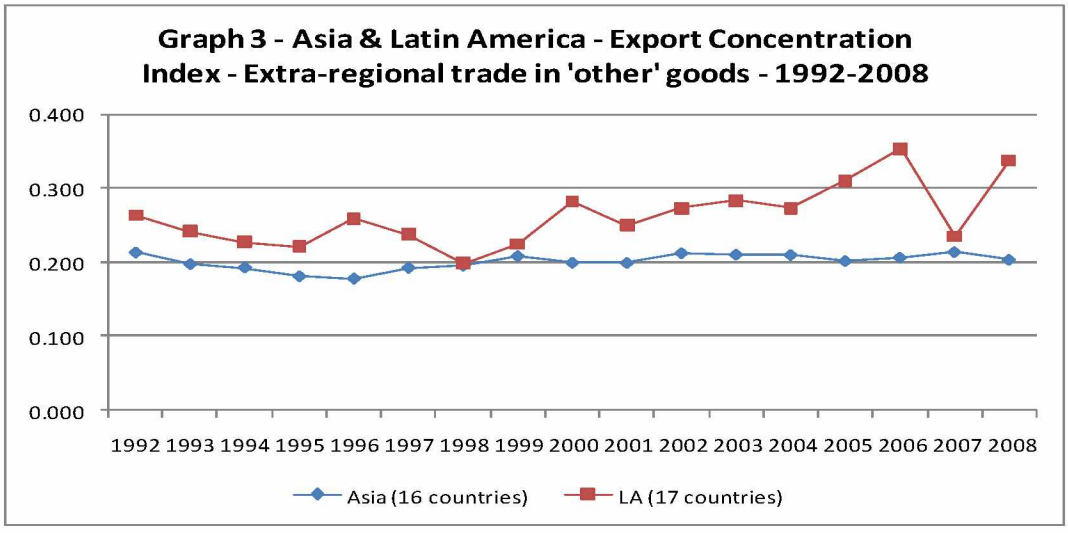
[87] R.Baumann (2010), The Geography of Brazilian External Trade: a BRIC with a limited regional focus. In Douglas Nelson, Bernard Hoekman (orgs) Political Economy of Trade Policy in the BRICs. World Bank Trade and Development Series, forthcoming.

[88] The Index is estimated as Hj = SQRT(SUM ij (xi / X)^2)) where xi is the value of export product i at SITC 4- or 5-digit level in Rev. 3 and X is the total category exports in country's j. This index (in this original, non-normalized form) has values varying between 0 and +∞.

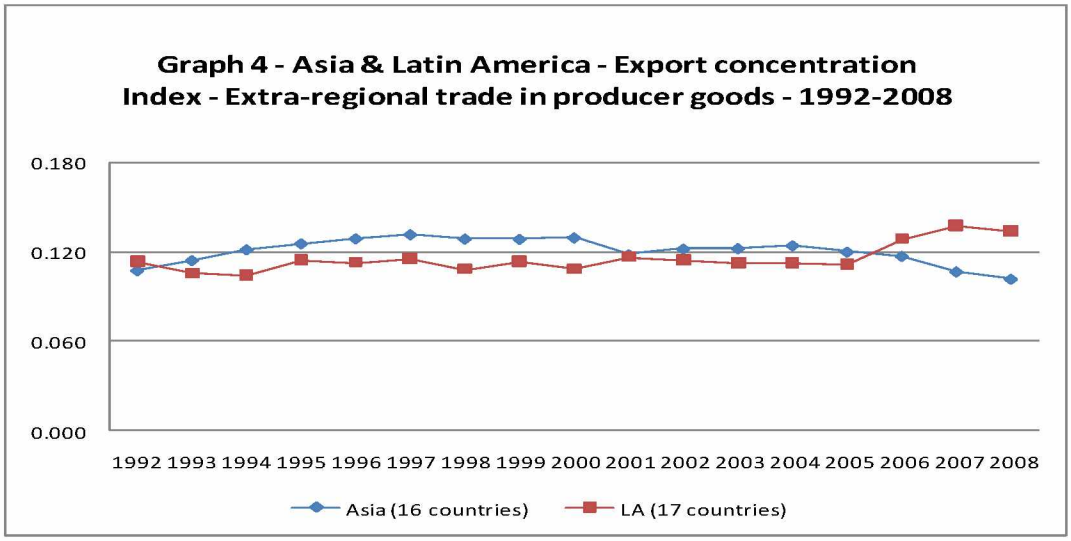
Table 16 - Asia and Latin America – Regional Exports to the Rest of the World 1992 - 2008			
Asia			
	1992-99		2000-08
Road vehicles	12.5%	Road vehicles	12.0%
Office/dat proc machines	12.0%	Office/dat proc machines	10.8%
Electrical equipment	11.3%	Electrical equipment	9.9%
Telecomms etc equipment	8.1%	Telecomms etc equipment	9.4%
Apparel/clothing/access	8.0%	Apparel/clothing/access	7.8%
Latin America			
	1992-99		2000-08
Electrical equipment	11.5%	Electrical equipment	12.1%
Road vehicles	8.0%	Road vehicles	8.4%
Industrial equipment nes	6.6%	Petroleum and products	6.0%
Telecomms etc equipment	5.3%	Industrial equipment nes	5.8%
Industry special machine	5.1%	Telecomms etc equipment	5.7%
Misc manufactures nes	4.5%	Office/dat proc machines	4.4%
Petroleum and products	3.7%	Misc manufactures nes	4.0%
Organic chemicals	3.6%	Power generating equipmt	3.5%
Metal manufactures nes	3.5%		

Graph 3 shows the results for the exports of non-producer goods by both regions to the Rest of the World (ROW). Asian exports are more diversified than the Latin American exports, throughout the whole period. Furthermore, while the Asian degree of concentration remained rather constant, around an index of 20%, the indication for Latin America shows frequent changes, with the degree of concentration for these goods having reached by the end of the period 1.5 times the corresponding index for Asia.



The results are a bit different when we consider the extra-regional exports of producer goods (Graph 4). The indexes for the two regions are much closer. The indicator for

Asia suggests a slightly higher degree of concentration (Asian exports of producer goods are probably more centered in some sectors) over most of the period of analysis. In the last three years this relation has changed, with opposite movements of the two indexes.



The corresponding indicators for intra-regional trade show, however, a rather different picturing. To start with, comparing the two sub-periods and considering the number of items corresponding to half of the total value it is clear from Table 17 that intra-regional Asian trade has become more concentrated in the 2000s than in the previous decade. Also, when compared with data on Table16 it is clear that there is a strong coincidence, at least at this level of aggregation, of products traded regionally and with the rest of the world, and a relatively stable composition of the set of products in the two sub-periods.

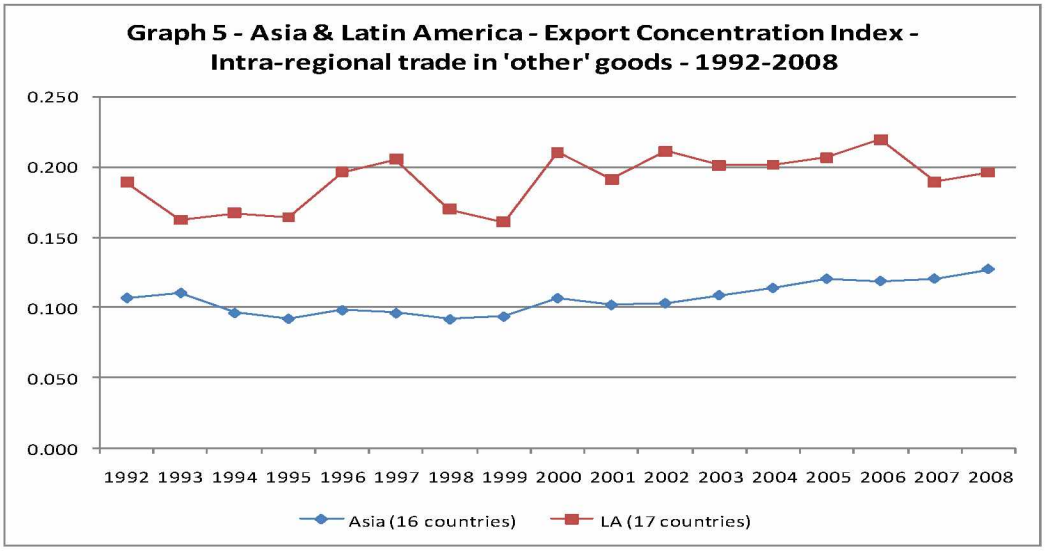
In Latin America, differently, once again there has been a light increase in the degree of diversification, but with a higher permanence of most sectors in the export bill in the two sub-periods, as compared with extra-regional exports.

Table 17 - Asia and Latin America – Intra-Regional Exports – 1992 - 2008

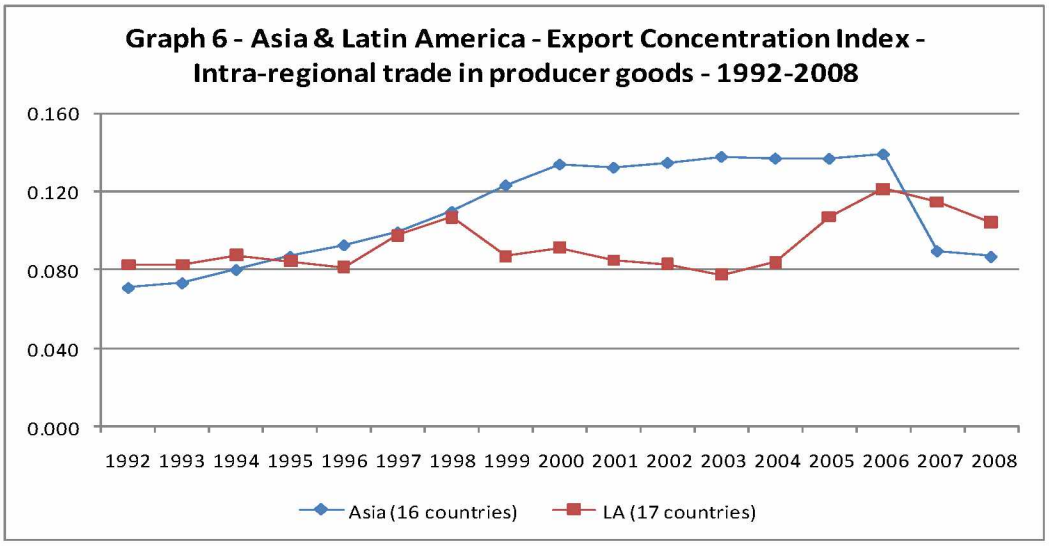
Asia			
	1992-99		2000-08
Electrical equipment	16.4%	Electrical equipment	21.5%
Textile yarn/fabric/art.	7.4%	Office/dat proc machines	9.0%
Office/dat proc machines	5.8%	Telecomms etc equipment	7.0%
Telecomms etc equipment	5.8%	Petroleum and products	5.0%
Petroleum and products	4.2%	Textile yarn/fabric/art.	4.4%
Apparel/clothing/access	4.2%	Iron and steel	3.6%
Industrial equipment nes	3.9%		
Misc manufactures nes	3.8%		
Latin America			

	1992-99		2000-08
Road vehicles	12.5%	Road vehicles	12.2%
Petroleum and products	10.5%	Petroleum and products	11.6%
Cereals/cereal preparatn	4.9%	Iron and steel	4.2%
Iron and steel	4.7%	Non-ferrous metals	3.8%
Textile yarn/fabric/art.	3.3%	Cereals/cereal preparatn	3.6%
Non-ferrous metals	3.3%	Pharmaceutical products	2.9%
Vegetables and fruit	3.0%	Metal ores/metal scrap	2.8%
Electrical equipment	3.0%	Textile yarn/fabric/art.	2.8%
Industrial equipment nes	2.8%	Industrial equipment nes	2.7%
Paper/paperboard/article	2.6%	Electrical equipment	2.6%
		Paper/paperboard/article	2.5%

When the analysis disaggregates between types of products it turns out that the intra-regional trade in 'other goods' in Latin America is far more concentrated than in Asia (Graph 5), very much as in the trade with third partners. The remarkable thing to notice, however, is that the difference in terms of concentration between the two regions is much higher in intra-regional trade: the concentration of Latin-American regional trade is twice as much as in the Asian intra-regional trade.



As far as the regional trade in producer goods is concerned, however (Graph 6), the Asian countries seem to be more focused, as their intra-regional trade was not only far more important in value terms, as shown in Table 15, but also far less dispersed during most of the period of analysis, with the sole exception of the last two years.



So far for aggregate indicators at a regional level. Since the present analysis stresses the role of 'hub' and 'spoke' countries, the next step is to evaluate these two groups of countries in each region in their trade relations with the other countries in the same region, in comparison to the concentration in the trade with the rest of the world. Table 18 shows the most important exporting sectors in the trade of the 'hub' countries in each region and the ROW.

Table 18 - Asia and Latin America – Exports by 'Hub' countries to the Rest of the World – 1992 - 2008

Asia			
	1992-99		2000-08
Road vehicles	20.0%	Road vehicles	17.2%
Electrical equipment	10.5%	Telecomms etc equipment	9.4%
Office/dat proc machines	9.3%	Office/dat proc machines	8.9%
Telecomms etc equipment	7.4%	Electrical equipment	8.0%
Misc manufactures nes	4.6%	Apparel/clothing/access	5.7%
Latin America			
	1992-99		2000-08
Road vehicles	10.7%	Road vehicles	11.9%
Electrical equipment	10.4%	Petroleum and products	10.7%
Petroleum and products	7.7%	Electrical equipment	9.2%
Telecomms etc equipment	6.5%	Telecomms etc equipment	8.3%
Iron and steel	4.2%	Office/dat proc machines	4.4%
Power generating equipmt	3.7%	Power generating equipmt	3.4%
Vegetables and fruit	3.6%	Industrial equipment nes	2.9%
Animal feed ex unml cer.	3.2%		

Figures in Table18 show a similar outcome as before: Asian 'hub' countries have their extra-regional trade focused on five sectors, which account for more than half their exports, and little change has taken place between the 1990s and the 2000s.

The extra-regional exports of Latin American 'hubs' are more disperse. It is worth noting, however, that these exports became more concentrated and two of the exporting sectors with high natural-resources component (vegetables and fruit and animal feed)[89] have disappeared from the list in the second sub-period. Notice, additionally, that at this level of aggregation there is no major difference in the types of products exported by the 'hub' countries in the two regions to the Rest of the World; as if in both cases they gradually converged to some international pattern.

Intra-regional trade is of course revealed by trade between 'hub' and 'spoke' countries and vice-versa.Table 19 show the exports by 'hub' countries to 'spoke' countries.

In the case of Asia it could be said that the list of sectors corresponding to half the total exported value is essentially a copy of the results shown in previous tables, with the only replacement of industrial equipment and apparel/clothing by office/data machines. Not surprisingly, the four largest economies in Asia determine the region's exports to the ROW. What is remarkable is to notice is that their export bill is similar, both for trade with other countries in the region and for extra-regional trade.

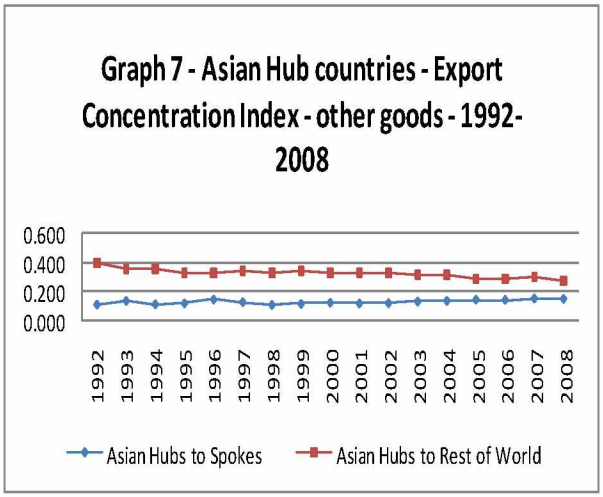
As for Latin American 'hubs', the degree of dispersion is much higher, in comparison with the regional exports by Asian 'hubs' and also with the exports by Latin American 'hubs' to the ROW, as is higher the rate of sector substitution over time: four sectors – cereals/cereal preparations, textile yarns, fixed vegetable oils and metal manufactures – have been replaced in this list by telecommunication equipment, pharmaceutical products, perfumes and cosmetic products and paper/paperboard articles.

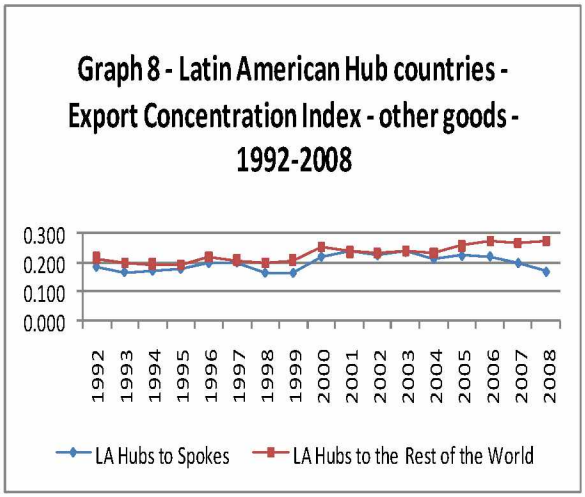
As different from their exports to ROW, therefore, Latin American 'hubs' have among their main exports to other countries in the region products with high components of natural-resources, such as petroleum and products, iron and steel and paper and paperboard articles[90].

[89] The third sector intensive in natural resources - petroleum and products - remained in the list.
[90] This of course reflects by and large the recent evolution of the international prices of commodities, which has significantly benefitted these countries, South Americans in particular. We will come back to this point in sub-Section VI.2.

Table 19 - Asia and Latin America - Exports from 'Hub' countries to 'Spoke' countries – 1992-2008			
Asia			
	1992-99		2000-08
Electrical equipment	19.2%	Electrical equipment	19.7%
Textile yarn/fabric/art.	6.9%	Office/dat proc machines	9.1%
Road vehicles	6.0%	Telecomms etc equipment	8.3%
Telecomms etc equipment	5.4%	Textile yarn/fabric/art.	4.9%
Industrial equipment nes	5.0%	Iron and steel	4.3%
Iron and steel	4.9%	Road vehicles	3.9%
Apparel/clothing/access	4.5%		
Latin America			
	1992-99		2000-08
Road vehicles	11.5%	Petroleum and products	11.6%
Petroleum and products	7.4%	Road vehicles	10.0%
Iron and steel	6.8%	Iron and steel	5.3%
Industrial equipment nes	4.0%	Telecomms etc equipment	4.9%
Electrical equipment	3.9%	Pharmaceutical products	3.8%
Cereals/cereal preparatn	3.7%	Electrical equipment	3.5%
Textile yarn/fabric/art.	3.6%	Perfume/cosmetic/cleansr	3.3%
Industry special machine	3.5%	Industrial equipment nes	3.2%
Fixed veg oils/fats	3.1%	Industry special machine	3.0%
Metal manufactures nes	3.0%	Paper/paperboard/article	3.0%

The evolution over time of the structure of the export bill in each case can be illustrated by the trajectory of the indexes of sector concentration. Graphs 7 and 8 show such indexes for the 'hub' countries in the two regions, in their trade in 'other' goods.





In both cases the degree of concentration of trade with the ROW has been systematically higher than in intra-regional trade, and in both cases the degree of concentration of 'hub' countries exports to 'spoke' countries is similar, close to 20%

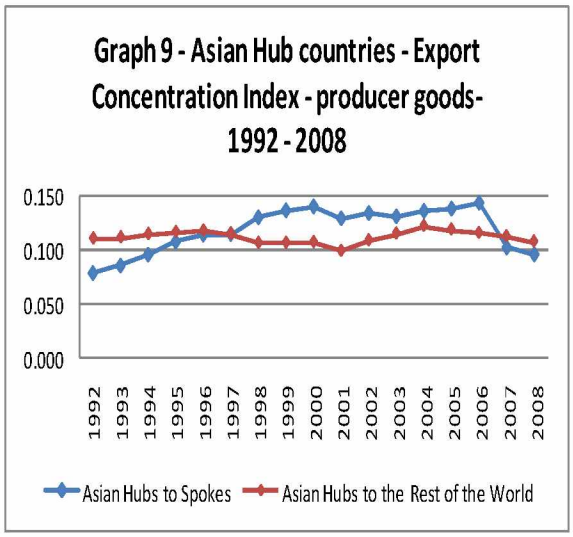
throughout the whole period. The trends are, however, different over time: while the Asian 'hubs' reduced their concentration index in the exports to ROW to almost half between 1992 and 2008, coming closer to the same level obtained in the intra-regional trade, the Latin American 'hubs' have actually increased their degree of concentration by almost 50% in the same period. There is, in Latin America, a higher dependency on a smaller number of products in its trade with the ROW[91].

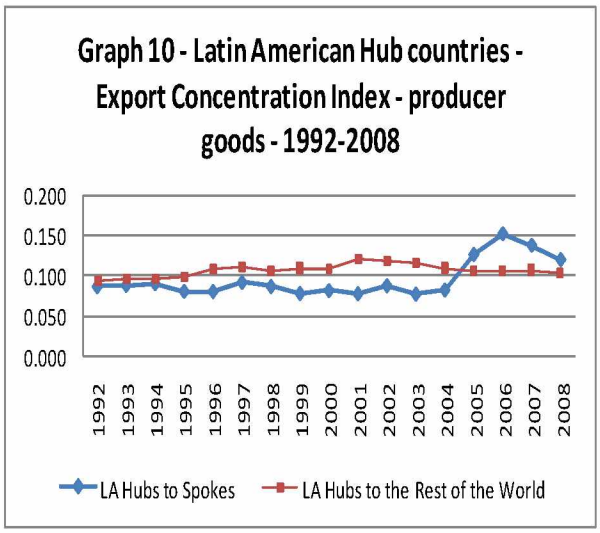
The focus of the present analysis is centered in the trade of producer goods. It remains, therefore, to evaluate the concentration of trade flows in these products, in each region.

Both the Asian and Latin American 'hub' countries present quite similar degrees of concentration in their trade with third countries in producer goods, with the indexes for both regions oscillating around 10% throughout the whole period (roughly half the index corresponding to 'other' goods; see Graphs 9 and 10). But there are marked differences in the relations within each region. The trade flows between Asian 'hubs' and 'spoke' countries have systematically been more concentrated (1.5 times on average) than the trade with the ROW during most of the period. This indicates a more focused relationship, centered in a smaller number of products for regional transactions, coupled to more diversified exports to the ROW.

Latin American 'hubs' present an almost inverse result. They had, at least until the mid-2000s, a rather diversified composition of trade in producer goods with the regional 'spoke' countries, which was less concentrated than observed in the exports to the ROW, represented half the degree of concentration in 'other' goods and about one-third of the corresponding index in Asia. Sector dispersion in producer goods exports by 'hubs' within a region suggests some degree of trade diversion in these products, a matter for further specific investigation, beyond the present purposes.

[91] Once again, a probable effect of the recent sharp increase in commodity prices.





In order to complete the picturing of intra-regional trade in the two regions it remains to analyse the exports of the 'spoke' countries. Table 20 presents the major indications.

The first obvious aspect to notice from Table 20 is the much higher concentration in the exports by 'spoke' countries to the ROW. In both regions the number of sectors accounting to half of the total exports is much smaller than what was obtained in the case of the 'hub' countries and for the region as a whole. This can be attributed to the lower degree of competitiveness of these economies as compared to their bigger neighbors.

The exports of Latin America 'spokes' are even more concentrated than the exports of their Asian counterparts and – not surprisingly – present a clear dependency on natural resources, whereas the exports by Asian 'spokes' to the ROW are essentially manufactures.

A quite different situation is found in intra-regional trade of 'spoke' countries in the two regions, as shown in Table 21. As different from the exports by 'hub' countries and as different from their trade with the ROW, intra-regional exports by Asian 'spoke' countries were in the 1990s more diversified than Latin Americans. In the two periods there has been a relative constancy of exporting sectors, although with an increased degree of concentration (miscellaneous manufactures and apparel/clothing were dropped from the list in the second period). Once again, intra-regional trade is mostly on manufactures, except for petroleum and gas.

Table 20 - Asia and Latin America – Exports from 'Spoke' countries to the Rest of the World – 1992 - 2008			
Asia			
	1992-99		2000-08

Office/dat proc machines	15.7%	Office/dat proc machines	13.8%
Apparel/clothing/access	13.0%	Electrical equipment	13.5%
Electrical equipment	12.4%	Apparel/clothing/access	11.6%
Misc manufactures nes	9.5%	Telecomms etc equipment	9.3%
Latin America			
	1992-99		2000-08
Petroleum and products	34.0%	Petroleum and products	35.7%
Non-ferrous metals	11.1%	Non-ferrous metals	11.3%
Vegetables and fruit	7.9%	Metal ores/metal scrap	9.4%

In Latin America intra-regional exports of 'spoke' countries are essentially products with a strong component of natural resources[92] – minerals and food – which signals a weak chain for the effects expected from a trade relationship based on industrialized goods: in this region the 'hubs' export a diversified set of producer goods to 'spokes' and import primary products from them. Hardly a dynamic relationship.

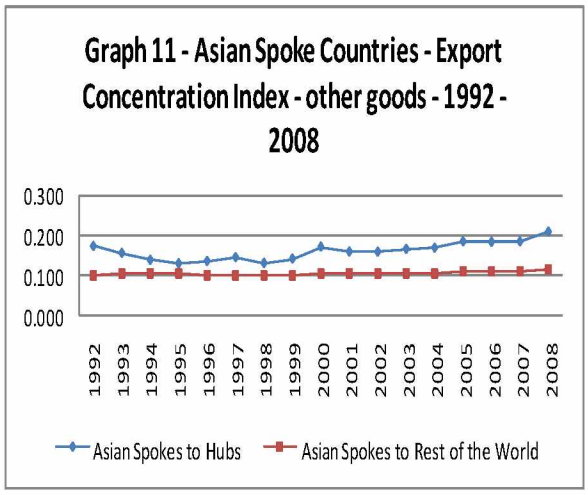
Table 21 - Asia and Latin America - Exports from 'Spoke' countries to 'Hub' countries – 1992-2008

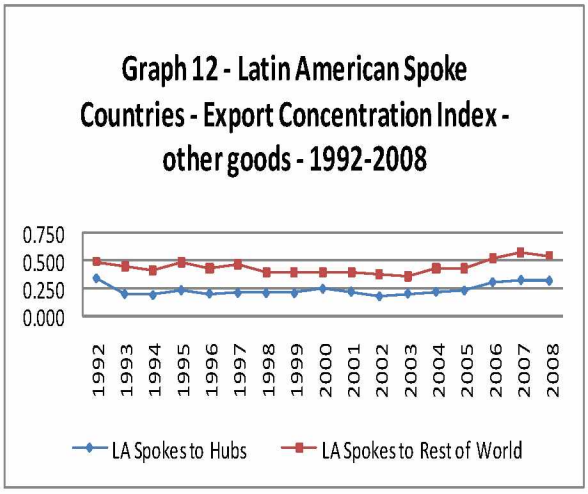
Asia			
	1992-99		2000-08
Electrical equipment	11.0%	Electrical equipment	21.4%
Textile yarn/fabric/art.	7.8%	Office/dat proc machines	9.1%
Office/dat proc machines	7.1%	Telecomms etc equipment	6.8%
Petroleum and products	6.6%	Petroleum and products	5.7%
Telecomms etc equipment	6.0%	Textile yarn/fabric/art.	3.9%
Misc manufactures nes	4.1%	Natural gas/manufactured	3.0%
Natural gas/manufactured	3.9%		
Apparel/clothing/access	3.5%		
Latin America			
	1992-99		2000-08
Petroleum and products	16.6%	Non-ferrous metals	16.5%
Non-ferrous metals	11.8%	Petroleum and products	10.9%
Metal ores/metal scrap	6.6%	Metal ores/metal scrap	9.0%
Vegetables and fruit	5.9%	Natural gas/manufactured	8.4%
Road vehicles	4.3%	Vegetables and fruit	3.6%
Cereals/cereal preparatn	4.2%	Cereals/cereal preparatn	3.3%

[92] Despite of the indications in Table 9 of an increase, in these countries, of the value-added in industry as percentage of GDP.

Graphs 11 and 12 show that for 'other goods' the exports of 'spoke' countries to the ROW are far more concentrated in Latin American than in Asia: the corresponding index is five times as high. The intra-regional trade is also more diversified in Asia, having gradually increased in recent years to reach 20%, whereas the Latin American index has been around 25% most of the period.

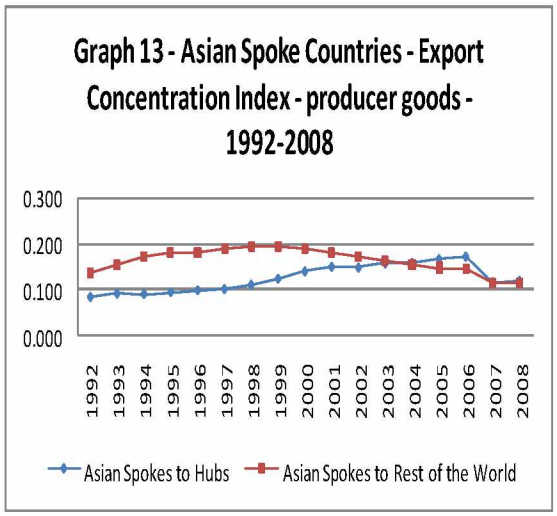
But more interesting still is the inverse relation between intra and extra-regional trade in the two regions: in Asia the exports by 'spokes' to third parts are more diversified than what the 'spokes' export to 'hub' countries, whereas in Latin American precisely the inverse relation obtains. Competitiveness and price effects do seem to matter in determining an export bill. This is probably a mirror image of the sector concentration of trade between 'spoke' and 'hub' countries in Asia, and most likely an indication of the higher and increasing competitiveness of production in Asia.

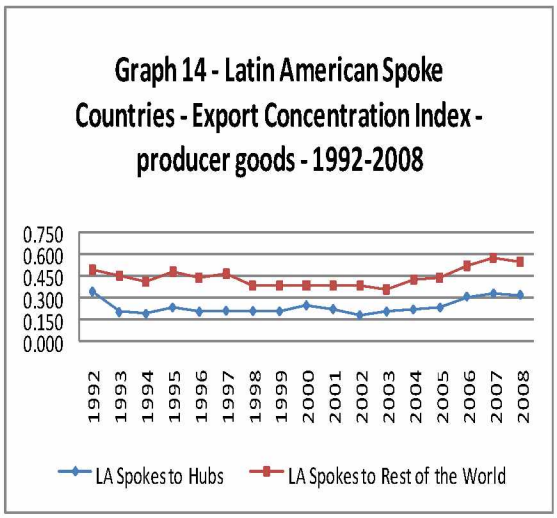




As far as the trade in producer goods is concerned (Graphs 13 and 14) the overall degree of concentration in Latin American exports by 'spoke' countries to the ROW is much higher (three or more times) than in Asia. In both cases the intra-regional exports by 'spoke' countries are systematically more diversified than their exports to the ROW. This should not be surprising, since small economies tend to be less competitive in the international markets, so have higher chances of market access on the basis of preferential treatment or as an outcome of productive complementarity.

Furthermore, the Asian 'spoke' countries have diversified their exports of producer goods to the ROW to the point that in recent years the degree of concentration of both trade flows is similar. In Latin America, differently, the two curves show an increasing trend, indicating increasingly concentrated exports.





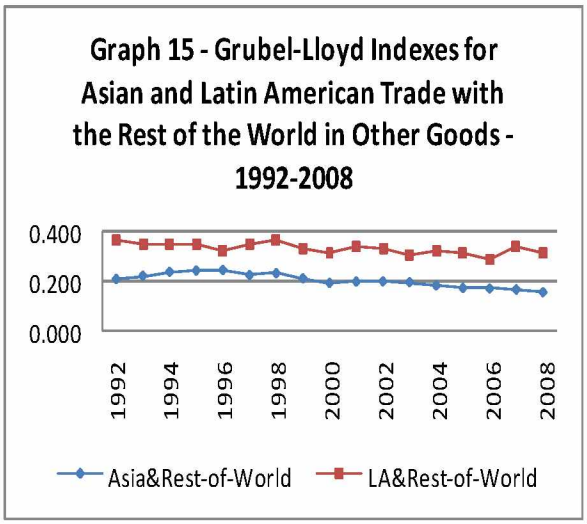
The above set of evidence relative to producer goods can be summarized as: i) Asian countries export a much higher value and a much higher proportion of producer goods than Latin Americans; ii) both regions present similar degrees of concentration in their exports of producer goods to the ROW, but this is by and large explained by the similar degree of concentration of the exports of the 'hub' countries in the two regions, whereas the differences are more pronounced among the 'spoke' countries; iii) regional trade in producer goods is much more concentrated in Asia than in Latin America (what suggests a higher sector concentration) and iv) the regional exports of producer goods by the 'spoke' countries in Asia are more diversified than their exports to ROW, but they have systematically increased in important proportions the degree of diversification of their exports to the ROW, what suggests a gradual gain in competitiveness, with the inclusion of new products in the export bill.

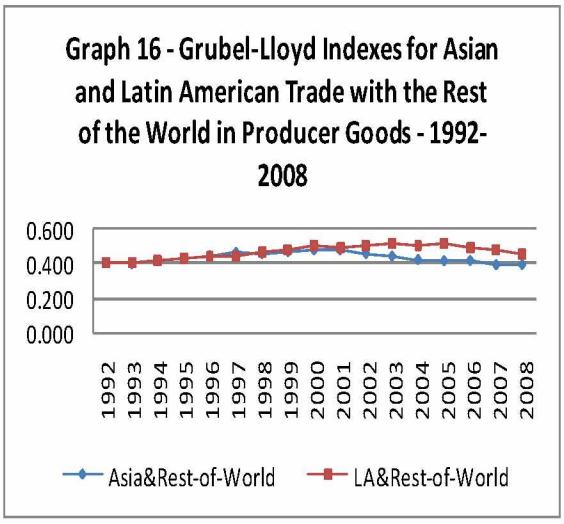
The above information, of significant regional trade by both 'hub' and 'spoke' countries in the two regions comprising similar sectors is suggestive of the existence of transactions of the intra-industry type. To evaluate the relative importance of such trade we have estimated the so-called Grubel-Lloyd Index of intra-industry trade[93], at the most disaggregated level (5-digit) allowed by the database. The basic results are shown in the Annex.

According to Graphs15 and 16, the incidence of intra-industry relations in Asian trade with the ROW in 'other goods' remained relatively constant, around 20%, throughout the whole period. This is hardly surprising, as it is well known that Asian countries import a good deal of primary products (food and raw material), in exchange for manufactures. The index for Latin American countries is systematically higher,

[93] The Grubel-Lloyd index is defined as: GLj = 1 -[sum|Xij -Mij| / (Xij + Mij)], where Xi and Mi are the values of total exported and imported products i respectively at SITC 4- or 5-digit level (Rev. 3) in country's j. The value of the index is ranked from 0 to 1.

averaging a little over 30%. This probably reflects the relatively significant trade in light manufactures, mainly with North America.





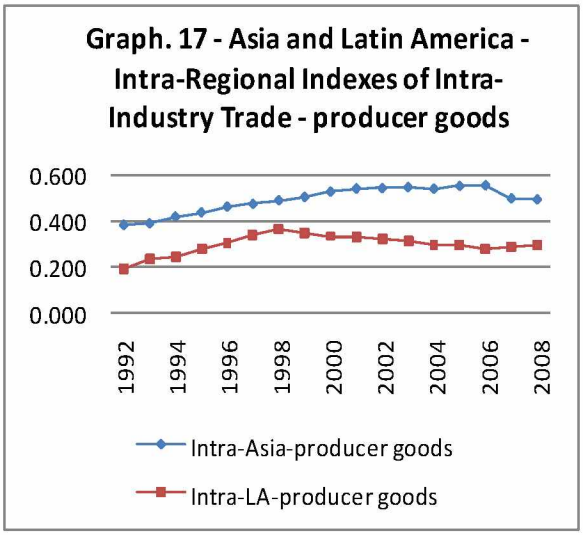
A different result comes out from the trade in producer goods. Here, for both regions a much higher proportion - about half - of their extra-regional trade is of the intra-sector type. This is a relatively high figure, and suggests that in their non-regional relations both regions export and import a similar amount of machinery, equipment and inputs. It remains to compare these results with the corresponding figures for intra-regional trade.

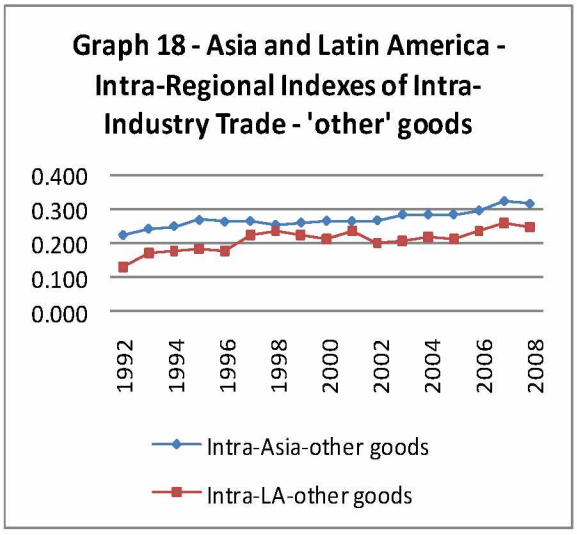
For that purpose we have estimated what might be called the 'regional' index or intra-industry trade. Estimates were made for each country (16 countries in Asia and 17 countries in Latin America) and each of its regional partners, as well as for each type of product, and the indexes thus obtained were aggregated in accordance to the trade weights of each country. This is shown in Graphs17 and 18.

In Asia the incidence of intra-industry regional transactions in producer goods is quite high, having reached a maximum of 55% in 2005 and 2006. The Latin American indexes are far more modest, with a maximum of only 36% in 1998. Considering the two subperiods 1992-99 and 2000-08 we would have on average: in Asia, 44.7% and 55.3% respectively, and in Latin America 28.4% and 30.3%, indicating that the relation between the indexes of intra-industry trade in the two regions has actually increased over time, from 1.5:1 to 1.8:1.

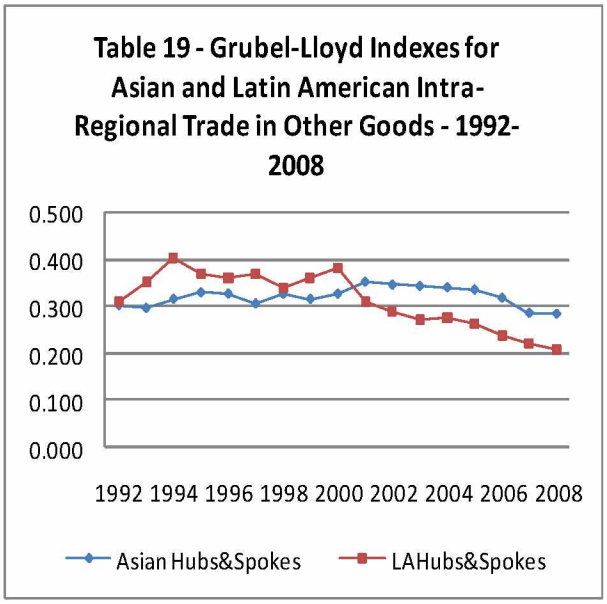
For 'other goods' the indexes are closer, but again with higher figures in Asia. An interesting indication that stems out from these estimates is that in both regions and for both types of products there is a rising trend in the relative importance of intra-industry transactions, following a rather universal trend. Once again, considering the

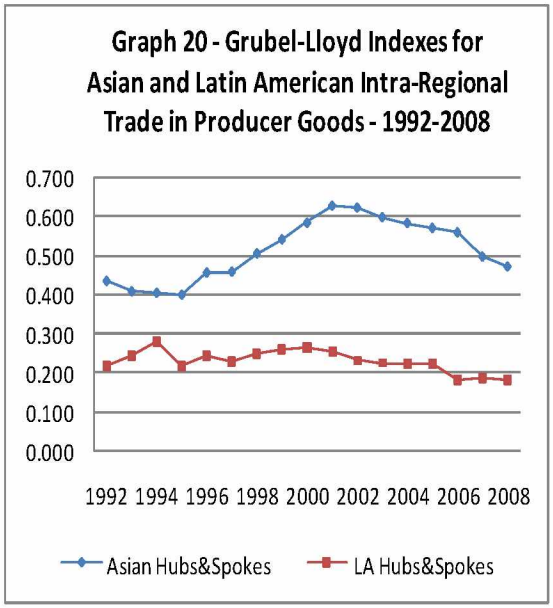
average for the two subperiods 1992-99 and 2000-08 we would have: in Asia, 25.5% and 28.9%, respectively, and in Latin America 19.2% and 22.6%.





The same exercise was made to identify the intensity of intra-industry trade between the set of 'hub'countries and 'spoke' countries in each region. The estimates were made for bilateral trade flows in various combinations, according to the partner countries (4 hubs and 12 spokes in Asia, 3 hubs and 14 spokes in Latin America) as well as for the type of products (producer goods and 'other goods'). The following Graphs 19 and 20 summarize the results.





Grubel-Lloyd indexes for regional trade in 'other goods' in Asia have oscillated between 28-35%, suggesting a relative constancy over time, whereas in Latin America these indexes reached 40% in the 1994 but then dropped systematically to

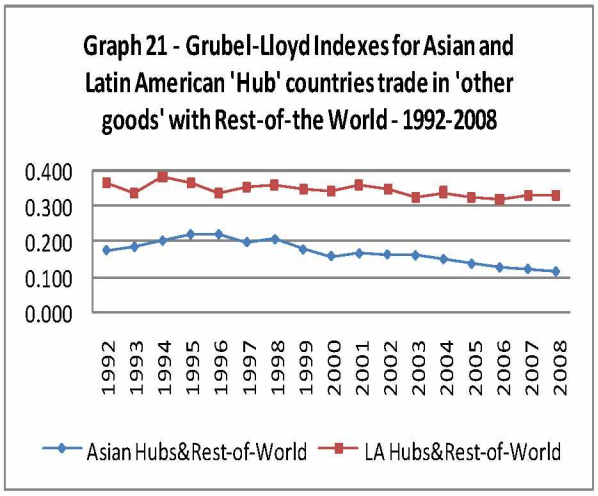
a low 21% in 2008. This has probably to do with the increasing importance of Latin American trade in primary products, in a period when the international prices of 'commodities' have boomed. This is consistent with the figures in Tables 19 and 21.

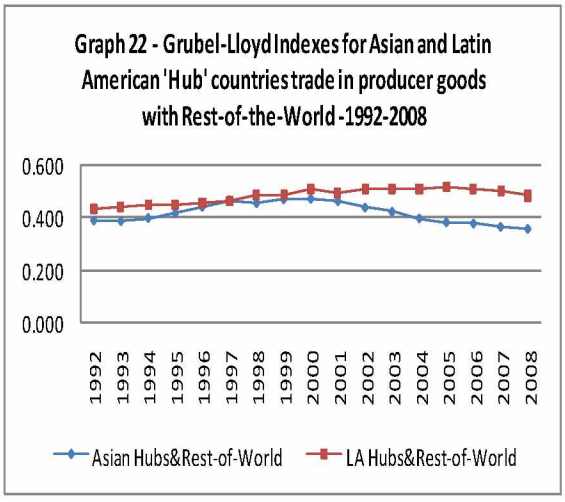
Notice that in Asia this corresponds to a higher figure than the one obtained for trade with the ROW: the degree of regional productive integration is quite significant[94]. For Latin America this corresponds to precisely the opposite outcome: Grubel-Lloyd indexes in regional trade have decreased and are much lower than the corresponding indexes for extra-regional trade[95].

A quite different result obtains for trade in producer goods. The figure for Asia jumps from 40% in the first half of the 1990s to a maximum of 62% in 2001 and 2002 and remains above the 50% level, a trajectory comparable with the one corresponding to trade with the ROW, according to Graph 17, whereas in Latin America the trajectory is flat, between a maximum of 28% in 1994 and a minimum of 18% in 2008.

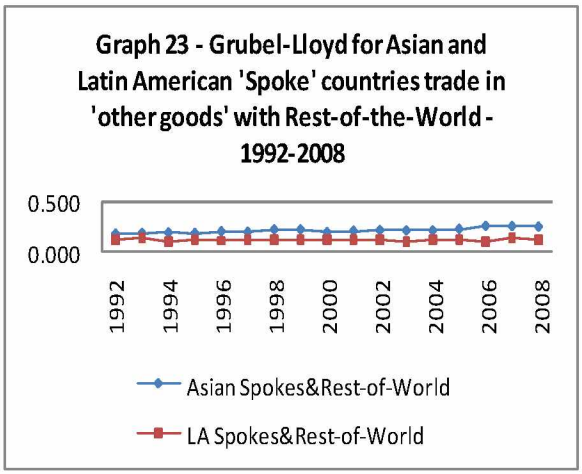
Once again, the regional figures for Asia are higher than the ones obtained for extra-regional trade[96], whereas for Latin America the indexes of intra-industry trade in producer goods at the regional level are much lower than the indexes for extra-regional trade[97].

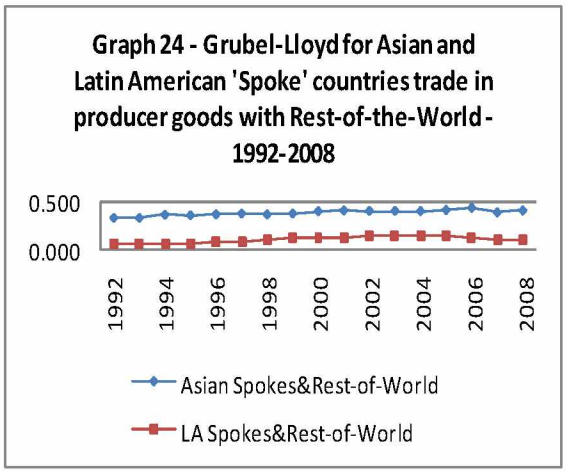
These results call for a closer examination of these indexes for 'hub' and for 'spoke' countries in their trade with the ROW. Graphs 21 to 24 show the estimated indexes.





[94] For 1992-2008 we obtain on average 32.1% for trade between Asia 'hubs' and 'spokes', compared to 20.6% for trade with ROW.
[95] For 1992-2008 the average indexes for Latin America are 33.4% for trade with ROW and 31.4% for trade between its 'hubs' and 'spokes'.
[96] Respectively 51,2% on average for trade between 'hubs' and 'spokes' and 44.0% for trade with ROW, in 192-2008.
[97] An average of 46.4% in trade with ROW and 23.0% for trade between 'hubs' and 'spokes'.





A simple, visual comparison of Graphs 21 to 24 suggests that most of the intra-sector trade observed in both regions in their relations with the ROW is by and large due to their 'hub' countries, since the average indexes are much higher in this case.

For trade in 'other' goods and the ROW the index of intra-industry transactions for Latin American 'hub' countries (34.4% on average in 1992-2008) is twice as high as for the Asian 'hubs' (16.9%). Latin American 'hubs' have also more intense intra-industry trade with the ROW with regard to producer goods: 48.4%, compared to 41.6% on average for the whole period. This is consistent with the results indicated in Graph 15.

Insofar as trade of 'spoke' countries with ROW is concerned a rather different picturing comes out. For trade in 'other' goods the average index for the period 1992-2008 is 21% for Asian 'spokes', compared to 11.8% for Latin Americans. For producer goods these averages are 39.2% for the Asians and only 11.0% for the Latin Americans. This is consistent with the information in Table 5 (Asian 'spokes' present a higher degree of merchandise trade as percentage of GDP) and in Table 10 (they present also a higher degree of manufactured exports as percentage of total merchandising exports).

Table 22 confirms that the indexes are quite close in both cases, with much lower indexes for 'spoke' countries.

Table 22 - Intra-Industry Indexes for trade with the Rest-of-the World – Asia and Latin America – 1992-2008

		Average 1992-99	Average 000-08
Producer goods			
Asia	Intra-regional (hubs&spokes)	45.1	56.7

	Hubs&ROW	42.7	40.7
	Spokes&ROW	36.6	41.5
	Total Asia&ROW	44.2	43.9
Latin America	Intra-regional (hubs&spokes)	24.3	21.8
	Hubs&ROW	45.9	50.6
	Spokes&ROW	8.8	13.0
	Total LA&ROW	43.0	49.3
Other goods			
Asia	Intra-regional (hubs&spokes)	31.5	32.6
	Hubs&ROW	19.8	14.2
	Spokes&ROW	19.6	22.2
	Total Asia&ROW	23.2	18.3
Latin America	Intra-regional (hubs&spokes)	35.9	27.4
	Hubs&ROW	35.4	33.4
	Spokes&ROW	11.8	11.8
	Total LA&ROW	34.8	32.1

Table 22 provides a good deal of relevant information. First, as already mentioned, the highest indexes correspond to intra-regional trade in producer goods in Asia. In the last decade this has reached quasi-European standards of intra-industry transactions.

The second remarkable figure refers to Latin American trade of producer goods with the ROW. The indexes for 'hub' countries in Latin America are high and have increased in recent years, as different from 'other' goods, where the indexes present a light reduction. At the same time, at the regional level these indexes have fallen, both for producer as well as for 'other' goods.

Third, in both regions intra-industry trade is far more intense in producer goods than in 'other' products, and for 'hub' countries more than for 'spoke' countries. Fourth, and particularly significant for the argument in the present report, the indexes of intra-industry trade are the lowest for Latin American 'spoke' countries. Fifth and lastly, the intensity of intra-industry transactions in the trade with the ROW is higher for Latin America 'hubs' – for both types of goods – than for Asian 'hubs'.

This set of data suggests, in summary, that intra-sector relations in Asia regional trade are very high, and more intense than observed in the relation with other regions. In Latin America, on the contrary, there is a significant and increasing similarity of the production of the 'hub' countries with the production patterns of economies in other regions, by and large reflecting a weakening of the links within the region.

This set of results presented so far helps to make a picturing of the overall characteristics of regional and extra-regional trade in the two regions. There remains to see some inference about the actual effect that these trade features might have on the output growth of the countries in each region. This is the subject of the next Section.

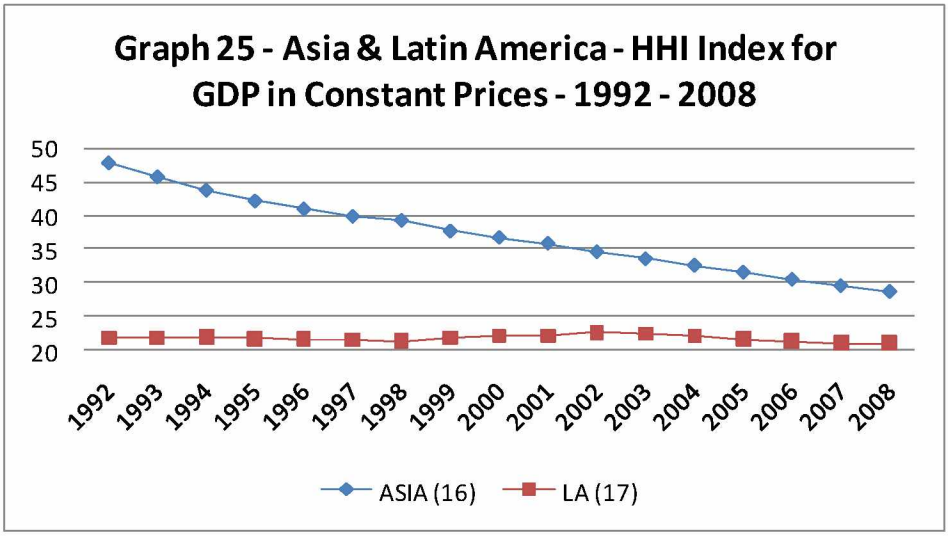
VII - The Impact on Regional Output Growth

As discussed in Section III, the relationship between trade features and output growth in each region is considered here under three perspectives: i) a comparison of the degree of homogeneity of growth rates achieved in each region; ii) the identification of the likely links between the composition of regional trade (that is, the relative weight of producer goods and 'other' goods) in determining the cohesion of output growth between 'hub' and 'spoke' countries in each region and iii) the identification, via correlation analysis, of the existence of a 'regional multiplier', where the 'spoke'-'hub' trade link is stronger then the linkes with the Rest of the World. The following sub-Sections present the empirical results in this sequencing.

VII.1 – Homogeneity of Regional Growth

The first dimension to consider is the actual degree of convergence of the yearly GDP growth rates in each region. An overall picturing can be obtained by some indicators of the degree of homogeneity of output growth. If growth takes place in a more homogeneous way in a region than in other this should be reflected in a reduced degree of dispersion of GDP among the several countries in the former region. This hypothesis can be tested by estimating an indicator of concentration of GDPs for each region. Graph 25 shows the results for the estimates of the Herfindahl-Hirschman index[98].

[98] The Index is estimated as Hj = SQRT(SUM ij (xi / X)^2)) where xi is the value of GDP of country i and X is the total value of GDP in the region j. This index (in this original, non-normalized form) has values varying between 0 and +∞.



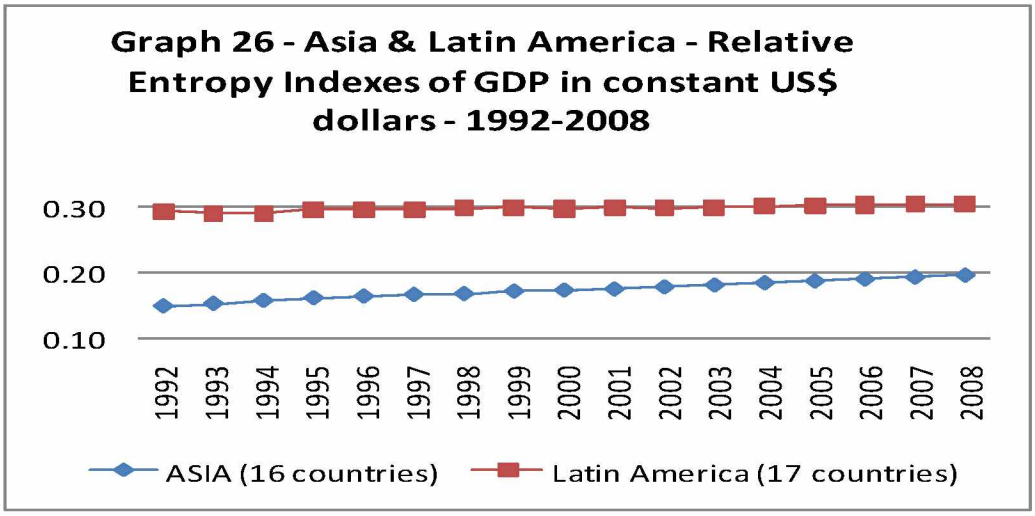
In Latin America the (limited) degree of homogeneity among the GDPs of the several countries remained rather constant over the whole period. This means that the distance between the bigger and the smaller economies has not varied significantly over two decades. This is particularly remarkable and worring, for a region where there are frequent efforts in providing preferential trade treatment coupled to common external tariffs.

From the moment a group of countries decide to adopt a common external trade policy this imposes (as discussed in Section II) the double challenge of defining the common external tariff in such a way that bnenefits all the partners and does not impose an additional burden on the participating economies. In a scenario with pronounced differences in the economic sizes of the participants and – even more – when these differences have remained relatively inaltered over time this is clearly a recipe to failure in the efforts to promote closer economic approximation. If not for other reason, for the simple fact that such scenario does not provide the economic agents the perception of gain in participating in the integration exercise, a necessary condition for their support.

At the same time, however, according to Graph 25 there was in Asia a sharp reduction of the degree of concentration, meaning that the smaller economies have been able to grow at such pace that the distance of their national product to the products of the bigger economies in the region has diminished at a very remarkable pace.

An alternative way of testing this result is to estimate an indicator of the opposite movement, that is, one that measures the degree of dispersion of the GDPs in each

region. For that purpose we have estimated the so-called Relative Entropy Index[99]. Graph 26 shows the results.



Graph 26 confirms the previous result: at the same time that the degree of dispersion among the GDPs of Latin American countries remained relatively constant in Asia there has been an intense movement towards increasing the degree of entropy, hence reducing the weight of the GDPs of individual countries in total regional product. Growth has become more homogeneous than at the beginning of the period.

These results are even more remarkable when one takes into account the pace of growth in the Asian 'hubs'. During this whole period the average yearly GDP growth rate for China was 10.4%, for India 6.7% and 5.1% for Korea. Japan, of course, lagged behind, hardly surpassing the 1%.

In Latin America the performance by the 'hubs' was much worse, with Argentina averaging 4.1% a year, Brazil 3.1% and Mexico 2.9%. Even so, it was not possible for the 'spoke' economies to catch up with the larger partners in terms of output value.

This same indication of convergence should be true also for the variations of output growth in each country with regard to the regional total, as well as with regard to the relation between yearly variations of output growth of 'hub' and 'spoke' countries in each region.

In order to check this hypothesis we analyzed the variation over time of the GDP values in constant 2000 US$ dollars of the several countries in both regions. The

[99] The relative entropy index (IRE) is computed as IRE = sum(Yij * LN(1/Yij) / max(LN(1 / Yij)), where Yij is the shares of GDP of country's i in total GDP of region j. This Index varies between 0 and 1. The closer to one, the smaller the relative weight of each component (in this case, the GDP of each country) and therefore the more homogeneous the set of countries.

regional total in this case is, evidently, the summation of the GDPs of the individual countries considered in this sample.

Table 23 summarizes the main results.

Table 23 - Asia and Latin America – Indicators of Convergence of GDP Growth Rates – 1992 - 2008			
	1992 - 2008	**1992 - 99**	**2000 - 08**
Standard Deviation of Individual Countries Growth Rates in relation to Total Regional Growth			
Latin America	0.235	0.364	0.212
Asia	0.193	0.420	0.181
Average Correlation Index between GDP Growth Rates for Hubs and Spoke Countries			
Latin America	0.625	0.267	0.871
Asia	0.746	0.878	0.869

Source: own processing based on primary data from World Bank WDI, 2010

According to the upper part of the Table it is clear that the degree of homogeneity of the growth process in Asia is much higher than in Latin America, as reflected by a smaller standard deviation of the growth rates of individual countries in relation to the regional total. It is worth noticing that the degree of convergence in Asia surpassed the corresponding Latin American indicator in the last decade. This should be no surprise, since as previously informed it was only since the late 1990s that a number of Asian countries have adopted a more open policy facilitating their productive links with the regional 'hubs'.

The lower part of Table 23 shows how the yearly growth rates of GDP are correlated among 'hub' and 'spoke' countries in the two regions. For the period 1992-2008 as a whole the index for Asia is much higher than the Latin American index, as expected. In the 1990s the difference is notably significant, whereas in 2000-08 the two indexes are quite close, with a smaller difference in favor of Latin America. This latter, rather surprising result is probably attributable to the significant positive shock of terms of trade that most Latin American countries have experienced in this period[100], with an overall impact on their output performance[101].

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[100] According to CEPAL, Panorama de la Insercion Internacional de America Latina y el Caribe 2008 the gains accruing from the terms of trade for Latin America as a whole corresponded to some 1% of GDP in this latter period.

[101] A disaggregated analysis, considering the geographical proximity of the hubs and spokes would indicate that this outcome is mainly concentrated in South America in recent years. If we consider the correlation indexes for 1992-08, 1992-99 and 2000-08 (as in Table 23) we obtain: a) for South America, 0.788, 0.650 and 0.846 respectively; b) for Central America 0.149, -0.014 and 0.389; c) for East Asia 0.753, 0.887 and 0.882, and for South Asia 0.694, 0.372 and 0.789. This reflects the systematically high

This is, of course, not a study on the sources of output growth. What these indicators suggest is that, in the case of Asia, if trade composition was not instrumental to foster growth it certainly was not harmful to an increasing convergence of growth rates. In Latin America, differently, after two decades of intense efforts to promote regional integration, with an unprecedented number of formal agreements being signed, the disparities among the GDPs of the several countries have remained almost unaltered.

Having shown that there are differences in the degree of homogeneity of output growth between the two regions, the next step is to evaluate to what extent the composition of the export bill affects the degree of homogeneity between output growth in 'hub' and 'spoke' countries. This has been done via econometric analysis, as reported in the next sub-Section.

VII.2 - Econometric Analysis

As informed in sub-Section III.2.2 the hypothesis of trade in producer goods leading to higher convergence of GDP growth was empirically tested also using econometric analysis.

The basic model tested was:

$$\text{corr IP } (i,j)_t = \alpha + \beta\ \text{TINT\_PG}_t + \gamma\ \text{TINT\_OG}_t + p\ \text{TRADE\_PG}_t + \mu\ \text{TRADE\_OG}t + \varepsilon_t$$

where

corr IP $(i,j)_t$ = correlation of the GDP growth index between each i ('hub') country and the j ('spoke') countries in period t

TINT_PG_t = bilateral trade intensity (in 'producer goods') between countries i ('hub') and j ('spoke') in period t

TINT_OG_t = bilateral trade intensity (in 'other goods') between countries i ('hub') and j ('spoke') in period t

TRADE_PG_t = trade of the region with the Rest of the World in 'producer goods' in period t

TRADE_OG_t = trade of the region with the Rest of the World in 'other goods' in period t

This relation was estimated for three different sets of countries:

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correlation of GDP growth rates in East Asia, the increasing correlation in South Asia, the scarce integration in Central America and the recent increase in South America.

a) for the set of 'hubs' and the set of 'spokes' in each region;
b) for each 'hub' individually and all the 'spokes' in each region;
c) for each 'hub' individyually and its likely area of influence, as indicated in the Annex.

The results for the aggregate data of each region tend to confirm the evidence presented elsewhere in this report. Starting with the relation between the set of 'hubs' and the set of 'spokes' in each region we obtain:

For Asia:

Cross-sections included: 15
Total panel (balanced) observations: 720

	Coefficient	Std. Error	t-Statistic	Prob.
C	0.266564	0.602218	0.442637	0.6582
TRADE_PG	1.545200*	0.544311	-2.838820	0.0047
TRADE_OG	1.090689	0.916624	1.189898	0.2345
TINT_P	1.130832*	0.499193	2.265322	0.0238
TINT_OG	1.064042	0.717686	1.482602	0.1386

S.E. of regression 0.448009 (*) significant at 5%

And for Latin America:

Cross-sections included: 15
Total panel (balanced) observations: 585

	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.092150*	1.413643	-3.602148	0.0003
TRADE_PG	5.938573*	1.090164	5.447414	0.0000
TRADE_OG	-4.150503*	1.630431	-2.545648	0.0112
TINT_P	-0.233886	0.919246	-0.254432	0.7993
TINT_OG	6.676564*	1.767085	3.778292	0.0002

S.E. of regression 0.489643 (*) significant at 5%

In accordance to previous reasoning, when considered the relation between 'hub' and 'spoke' countries in Asia we get a positive and statistically significant influence of trade in producer goods, both in regional trade and in trade with the Rest of the World. Trade in these products does affect the relation between output growth of 'hub' countries and 'spoke' countries.

In Latin America, differently, the indications are of a negative (although statistically non-significant) coefficient for regional trade in producer goods but high and significant coefficients for regional trade in 'other goods' as well as in trade with the Rest of the World in both products.

The same hypothesis was tested for each of the 'hubs' in each region, in order to verify to what extent these results are a regional characteristic or whether they refer to the trade relations for only some of the countries.

Not every 'hub' has systematically significant trade relations with every 'spoke' in its region. To deal with this fact, we tried to identify what would be a likely 'area of influence' of each 'hub', meaning by that the countries more geographically close to the 'hub' and with which the 'hub' had in the period of analysis more intense trade relations. This is illustrated in the Annex.

The results for these individual regressions are summarized on Tables 24 and 25. These Tables show the signal of the coefficients obtained that are significant at the 5% level of significance. The basic information is displayed in the Annex.

Table 24 – Regression coefficients for the trade relations between each 'hub' and all the 'spokes' in each region

	China	Korea	Japan	India	Argentina	Brazil	Mexico
C		-		+	-		
Trade_PG	+		-		+		-
Trade_OG		+		-	-		
TINT_P	+		-	-	+		-
TINT_OG		+	+	-	+		+

i) cross-sections included: 15; ii) total panel (balanced) observations: 180

Table 25 – Regression coefficients for the trade relations between each 'hub' and the 'spokes' in its presumed 'area of influence'

	China	Korea	Japan	India	Argentina	Brazil	Mexico
C		-		+	-	-	
Trade_PG	-		-	-	+	+	-
Trade_OG		+	+		-		+
TINT_P	+	-	-	-	+		-
TINT_OG		+	+		+		+

i) cross-sections included: 15; ii) total panel (balanced) observations: 135

The exercise for individual countries did not provide a clear picturing, though. The results for China are in conformity with the results obtained for the whole region, but the other Asian 'hubs' have mixed results – more intense contribution of 'other goods' in the case of Korea and Japan, and all negative coefficients in the case of India. The

same applies to the results for Latin America, where surprisingly Argentina indicates high, positive and statistically significant coefficients for regional trade in producer goods, whereas the coefficients obtained for Brazil are mostly non-significant statistically.

No clear conclusion can follow from Tables 24 and 25. One probable reason is the relatively small number of observations (about one-sixth of the sample for the whole regions). Another reason is probably the absence of other factors. Certainly in the case of Latin America, as already mentioned, the recent variation of the terms of trade has contributed to influence this relation between 'hubs' and 'skope' countries. But a more detailed treatment is beyond the purposes of this work, the alternative being the usual claim for more detailed analysis.

It remains to test the existence of the third perspective considered here for the relationship between trade and growth, namely the existence of a 'regional multiplier'.

VII.3- The Regional Multiplier

Sections III and IV have referred to the concept of a 'regional multiplier'. Essentially the idea is that where there is regional trade in producer goods in exchange for 'other' goods between 'hubs' and 'spoke' countries there is a virtuous process whereas the exports of producer goods by a 'spoke' might stimulate its imports of 'other' goods from the 'hub', hence both countries gain and the process seems sustainable over time. There is a multiplication process.

In order to verify the existence of such mechanism the analysis has focused on thirteen vectors: exports of producer goods from spokes to hubs (XSpgH); exports of other goods from spokes to hubs (XSogH); imports of other goods by spokes from hubs (MSogH); imports of other goods from hubs by hubs (MHogH); imports of producer goods from hubs by hubs (MHpgH); exports of producer goods from spokes to spokes (XSpgS); exports of other goods from spokes to spokes (XSogS); exports of producer goods by spokes to ROW (XSpgRW); exports of other goods by spokes to ROW (XSogRW); imports of other goods by spokes from ROW (MSogRW); exports of producer goods by hubs to ROW (XHpgRW); exports of other goods by hubs to ROW (XHogRW) and imports of other goods by hubs from ROW (MHogRW).

As explained in Section III, there are five relevant relations to be considered:

1.Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXSpgH. ΔMSogRW)

2. Corr (ΔXSogH. ΔMSogH) > Corr (ΔXSogRW. ΔMogRW)

3. Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXHogRW. ΔMHogRW)

4. Corr (ΔXSogS. ΔXSpgS) > Corr (ΔXSpgRW. ΔMSogRW)

5. Corr (ΔMHogH. ΔMHpgH) > Corr (ΔXHpgRW. ΔMHogRW)

Before we go into that, however, Table 26 shows some relevant previous information, regarding the actual values involved as well as the rates of variation over time in both regions.

Table 26 - Asia and Latin America – selected trade flows – 1992 – 2008

	1992-99	2000-08	1992-99	2000-08
	Average value (US$ billion)			
	Asia		Latin America	
XSpgH - exports of producer goods from spokes to hubs	81	218	2	4
XSogH - exports of other goods from spokes to hubs	62	128	4	6
MSogH - imports of other goods by spokes from hubs	77	136	5	14
MHogH - imports of other goods from hubs by hubs	48	132	6	11
MHpgH - imports of producer goods from hubs by hubs	75	247	6	12
XSpgS - exports of producer goods from spokes to spokes	104	192	4	7
XSogS - exports of other goods from spokes to spokes	47	97	6	15
XSpgRW-exports of producer goods by spokes to ROW	137	220	9	24
XSogRW - exports of other goods by spokes to ROW	145	226	41	98
MSogRW-imports of other goods by spokes from ROW	91	170	19	40
XHpgRW-exports of producer goods by hubs to ROW	235	515	61	142
XHogRW-exports of other goods by hubs to ROW	156	382	68	163
MHogRW-imports of other goods by hubs from ROW	190	474	44	91

The first aspect to remark fromTable 26 is, of course, the difference between the actual values of each trade flow in Asia and in Latin America. The dimensions are very different indeed. Second, if for Asia there is a relative homogeneity in the values of the different flows, for Latin America the most relevant values are concentrated in the bottom part of the Table, and refer to trade with the Rest of the World. This is compatible with evidence presented so far, of a higher degree of regional trade relationship in Asia.

The analysis covers the period 1992 to 2008 and is based on the specific databank built for this project. The analysis had to take into account the incidence of 'outlier' observations in year 2007 in Asia. For the several trade flows comprising producer goods (among spoke countries, between spoke and hubs and between spokes and the Rest of the World) the average yearly variation is around 10% in every other year. In 2007, however, there were negative variations in all these flows, and the normal

pattern resumed in 2008. And this is not the outcome of any inference[102]: there are complete information for all countries in 2006 and 2007.

It is beyond the present purposes to investigate the reasons for such change. Suffice it to say that two procedures were adopted to deal with this situation: i) to consider the period until 2006 and ii) to consider the whole 1992-2008 period but dropping the data for year 2007. These procedures were repeated for the Latin American data. Table 27 shows the main results, for correlation indexes above 80%.

The first aspect to notice is the differences in the relative incidence of correlations. We took as a reference the correlation indexes above 80%, as indicative of a rather intense coordination between the variations of each pair of variables. The actual data are presented in the Annex. What stands out from Table 27 is that in Asia there are far more cells indicating strong correlation in comparison to Latin America. Most of them are concentrated on the intra-regional variables. This is an indirect confirmation of the existence in Asia of a more elaborated network and degree of complementarity than suggested by the results for Latin America.

Table 27 - Asia and Latin America - Incidence of Correlations > 80% in 1992-2008 (dropping year 2007)

ASIA

	ΔXSpgH	ΔXSogH	ΔMSogH	ΔMHogH	ΔMHpgH	ΔXSpgS	ΔXSogS	ΔXSpgRW	ΔXSogRW	ΔMSogRW	ΔXHpgRW	ΔXHogRW	ΔMHogRW
ΔXSpgH		X	X	X	X	X							
ΔXSogH	X		X	X	X		X			X			X
ΔMSogH	X	X		X	X		X			X			X
ΔMHogH	X	X	X		X	X	X						
ΔMHpgH	X	X	X	X		X							
ΔXSpgS	X			X	X								
ΔXSogS		X	X	X					X	X			X
ΔXSpgRW													
ΔXSogRW							X			X	X		X
ΔMSogRW		X	X				X		X				X
ΔXHpgRW									X				
ΔXHogRW													
ΔMHogRW		X	X				X		X	X			

LATIN AMERICA

	ΔXSpgH	ΔXSogH	ΔMSogH	ΔMHogH	ΔMHpgH	ΔXSpgS	ΔXSogS	ΔXSpgRW	ΔXSogRW	ΔMSogRW	ΔXHpgRW	ΔXHogRW	ΔMHogRW
ΔXSpgH					X								

[102] As different from 2007, for some other years and some countries we had to rely on information provided by the 'partner' country, to fulfill blanks in the UN/COMTRADE data base, as already informed.

ΔXSogH																								X
ΔMSogH								X		X														
ΔMHogH					X					X														
ΔMHpgH	X				X			X																
ΔXSpgS													X											
ΔXSogS												X												
ΔXSpgRW																								
ΔXSogRW																								X
ΔMSogRW																								
ΔXHpgRW																								
ΔXHogRW																	X							
ΔMHogRW																								

With these results in mind we now turn to evaluate the five relations between specific correlation indexes, as mentioned. Table 28 shows the basic results.

Table 28 - Asia and Latin America – Correlation between selected pairs of indicators

1992 - 2006				
Asia			Latin America	
Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXSpgH. ΔMSogRW)	0.954 > 0.831	OK	0.699 < 0.779	**NO**
Corr (ΔXSogH. ΔMSogH) > Corr (ΔXSogRW. ΔMSogRW)	0.917 > 0.826	OK	0.736 > 0.413	OK
Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXHogRW. ΔMHogRW)	0.954 > 0.381	OK	0.699 > 0.515	OK
Corr (ΔXSogS. ΔXSpgS) > Corr (ΔXSpgRW. ΔMSogRW)	0.761 > 0.635	OK	0.896 > 0.614	OK
Corr (ΔMHogH. ΔMHpgH) > Corr (ΔXHpgRW. ΔMHogRW)	0.868 > 0.744	OK	0.861 > 0.501	OK
1992 – 2008 (DROPPING YEAR 2007)				
Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXSpgH. ΔMSogRW)	0.820 > 0.597	OK	0.665 < 0.777	**NO**
Corr (ΔXSogH. ΔMSogH) > Corr (ΔXSogRW. ΔMSogRW)	0.923 > 0.858	OK	0.756 > 0.404	OK
Corr (ΔXSpgH. ΔMSogH) > Corr (ΔXHogRW. ΔMHogRW)	0.820 > 0.362	OK	0.665 > 0.590	OK
Corr (ΔXSogS. ΔXSpgS) > Corr (ΔXSpgRW. ΔMSogRW)	0.684 > 0.450	OK	0.897 > 0.736	OK
Corr (ΔMHogH. ΔMHpgH) > Corr (ΔXHpgRW. ΔMHogRW)	0.860 > 0.739	OK	0.861 > 0.272	OK

According to Table 28 both regions present the degree of intra-cohesion that characterizes regional experiments. Even with much smaller values involved it is to some extent rather surprising – on the basis of previous reasoning – that in Latin America the variations of regional trade flows seem to be also more coordinated than

the trade relations with the Rest of the World. Trade in other goods between hubs and spokes is more correlated than trade in these products with the Rest of the World, trade among hubs is more correlated than trade of hubs in other goods with the Rest of the World, and the same applies to trade among spokes.

The biggest difference is to be found – again as originally argued – in the actual relationship between exports of producer goods by spokes to hubs and their imports of other goods. In Asia there is clearly a link between exports by spokes and imports from hubs that is more intense than the alternative exports by spokes and imports from the Rest of the World. This characterizes a 'regional multiplier', where both types of countries gain over time. A different scenario is observed in Latin America, as suspected: there is a 'leakage' in the regional flow that leads part of the foreign currency earned by spokes from their exports to regional hubs being spent in other goods from the Rest of the World.

It seems reasonable to accept, therefore, that the hypothesis advanced in Section IV applies for the two regions. In Asia the complementarities in productive process coupled to the preferences for regional final products lead to a virtuous process, more intense than the relations with other regions. In Latin America, differently, the regional links are not sufficient to compensate for the existing strong links with other regions, so that a given stimulus will sooner or later imply more imports from the ROW than stimulate regional transactions.

VIII – Policy Recommendations

This work departs from a specific perception: the efforts to promote regional integration in Latin America have intensified in recent years, but with two characteristics. On the one hand, the results in terms of the share of intra-regional trade in relation to total trade are still not as brilliant as expected, and lag behind the corresponding indicators for other regions. On the other hand, it is easier to see the motivation for negotiations from a political rather than an economic rationale.

This is to some extent the outcome of the very lack of clarity with regard to why do these countries actually need regional preferential treatment. If in the 1950s and 1960s regional integration was an instrument to facilitate industrialization, if in the 1980s it was a mechanism to allow for trade and reactivation of idle productive capacity and in the following decade a political tool to foster competitiveness without price pressures, in recent years there is hardly a clear signaling in terms of a well-defined economic motivation.

Furthermore, to the extent that freer international movements of capital affect bilateral parities and hence the results of bilateral trade relations the lack of a clear objective coupled to limited results might increase the degree of skepticism on the part of the

economic agents with regard to the negotiating efforts and the demand for concessions. Economic agents in Latin America face, therefore, the double challenge of a) having to cope with an increasing competition by Asian products without b) being able to count on regional complementarity to match the competitors' lower production costs.

It is with this background that the present work adopts another dimension of analysis. The recent experience in Asia provides at the same time an example to be taken into account and a challenge, to be met ideally on a regional scale.

A summary presentation of the main results obtained here would comprise:

.there are (at least) two major characteristics that differentiate Latin America and Asia external trade – the participation of natural resources-intensive products (higher in the former) and the participation of producer goods (more intense in the latter)

. Asian trade is more sectorally focused at the intra-regional level, and more diversified in the links with the Rest of the World as compared to Latin America. This is an indication of competitiveness stemming from complementarity

.in both regions it is the 'hub' countries that determine most of the characteristics of their trade with the Rest of the World. 'Spoke' countries tend to have a more diversified export bill in their regional relations than in their trade with other regions. The major differences between the two regions in terms of concentration of exports as well as in terms of the relative importance of intra-industry trade stem from the 'spoke' countries

.Asian 'spoke' countries have more diversified export bill than Latin American 'spokes'. These tend to be concentrated in primary products, in spite of the indications of gains in the participation of the manufacturing sector in GDP

.Latin American regional trade structure is peculiar, in that it is the 'hub' countries that export a diversified set of producer goods to 'spoke' countries and import 'non-producer' (mainly primary) goods from them. An inverse structure than the one found in Asia, where the 'hubs' import producer goods from the 'spoke' countries and these import 'other' (final) goods from the former

.both regions present a similar and high degree of intra-industry trade in producer goods with the Rest of the World. But in intra-regional terms it is the Asian countries that are far more integrated: intra-industry transactions in regional trade in producer goods in Asia reach quasi-European levels

.most of the intra-industry trade with the Rest of the World in both regions corresponds to 'hub' countries; the corresponding index for Latin American 'spoke' countries is extremely low. This characterizes a worrying Latin American characteristic: 'hub'

countries are increasingly integrated with the Rest of the World, exporting producer goods to the regional 'spokes' and importing primary products from them. Clearly a weakening trend for the regionalization process

.in the last two decades Asian GDPs have become more homogeneous, reducing regional disparities. In Latin America the indicators of homogeneity show a constant performance, indicating that the distance between 'hubs' and 'spoke' countries has not changed over a significant period of time

.in Asia there is indication of a 'regional multiplier' in that the relation between the imports by 'hubs' of producer goods from 'spokes' is closely linked to imports by 'spokes' of other goods from 'hubs'. This link is stronger than the imports by 'spokes' of other goods from the Rest of the World, and it generates a virtuous circle where both types of countries gain from regional trade. In Latin America, differently, producer goods go from the 'hub' countries to the 'spoke' countries and these tend to import more 'other' goods from the Rest of the World than from the regional 'hubs'.

These nine differences between the two experiences, coupled to the lack of a clear economic objective for regional negotiations provide a scenario in which it should be no surprise that more resistence is found in Latin America with regard to bilateral concessions.

Productive complementarity makes the import competing sectors in Latin America to face not only the competition by one exporting Asian country, but also the effects of exchange-rates and the differences in cost structure of several coutries at a time. A good deal of the positive results obtained recently by Asian countries is associated to their participation in fragmented productive chains. The higher the incidence of fragmentation in a given sector the more pressing it becomes for the producers in that sector to adhere to that model. This Asian characteristic represents, therefore, a challenge to Latin American competitiveness in the medium term.

It was also shown that a good deal of these results were achieved mainly at a time when a number of Asian countries have adopted more open trade policies and more friendly (rather, pro-active) policies towards foreign investors.

The central question is how Latin American policy-makers should read the evidence provided in this work. It is not clear whether the central recommendation to Latin American countries should be the full reproduction of the Asian model, as pictured here.

An immediate (shallow) reading of these results would suggest that a scenario of open trade and zero or low barriers to investors, as adopted by several Asian countries recently, would be a sufficient condition to allow market forces to operate.

Evidence shown here suggests that Asian economies are more open to trade than their Latin American counterparts. But averages can be misleading. More important to the present argument is the sector incidence of trade barriers. For instance, in a comparison of Brazilian tariffs to the Chinese and Indian structures Araujo/Costa (2010)[103] have shown that Brazilian barriers to intermediate products are much higher, which directly affects productive competitiveness.

Latin America is a 'middle class' region, meaning that the fact that all the countries therein are classified in the lower to upper middle income levels. Latin America labor costs are not as low as in several Asian countries, because labor is not as abundant. Instead, the rich endowment in natural resources makes Latin America policy-makers consider it in some moments as a blessing and in other times as a curse, for the impact the exports of primary products may actually have on the real exchange rate, thus negatively affecting the competitiveness of manufactures. With the increasing competition by Asia in labor-intensive activities it is hard not to think that Latin American competitive advantages are increasingly to be determined less by its labor costs than by its endowment of natural resources and/or technological progress.

This has several policy implications, from the identification of the activities to be stimulated if a 'pick-the-winner' approach is adopted to the effects on the process of designing import tariff structures. Needless to say, this affects also the selection of sectors where there could be efforts to promote productive complementarity on a regional basis.

At the same time, the Asian 'model' pictured here is not free of some important problems. The list of doubts associated to this model can be long, but the analysts of the Asian experience emphasize five sets of questions: a) to what extent is it predominantly a mechanism to provide transnational companies with lower production costs? To what extent has it impacted positively the labor markets in the participating countries?; b) to what extent is the export activity linked to the rest of the economy in these countries? Or are these enclaves?; c) to what extent there is actually diffusion of technical progress within each country? The Mexican experience with 'maquiladoras' has originated a large literature that criticizes the model precisely for its scarce relation with other sectors of the Mexican economy; d) to what extent is the Asian model of trade consolidating a distortion in geographical terms, once it is known that this model is increasingly based on a number of productive units in some areas, located close to maritime transportation facilities?; e) to what extent is this model contributing to deepen the income concentration already existing in Asian countries (given that they

[103] J.Tavares de Araujo, K. Pereira da Costa. Abertura comercial e insercao internacional: os casos do Brasil, China e India. In R. Baumann (org) O Brasil e os demais BRICs – Comercio e Politica. CEPAL/IPEA. Brasilia. 2010

have benefited workers and regions that do not necessarily correspond to the areas with the highest concentration of the population in these countries)?

Growth rates per se should not be a policy objective, if the associated social cost is high. At the same time, the evaluation of such costs has to take into account the available alternatives. A clear affirmative with regard to the experiences evaluated here is well beyond the present purposes.

The important aspect to retain, as far as policy lessons are concerned, is that there are a number of indicators pointing to a more favorable performance in recent years in Asia than in Latin America, both in trade and in output growth.

The policy suggestions to Latin American countries following the present analysis are varied.

The first recommendation comprises, before anything else, the need to consolidate the perception of stimulating regional trade as a tool to face competing challenges from other regions. This could provide a direction to be followed and help guide the actual negotiations.

In a second place, and as a consequence, comes the set of 'usual suspects': there are a number of policy initiatives that most analysts having been recommending for many years, and yet the small progress achieved in these areas make them as opportune as ever. These comprise the need for reducing intra-regional trade barriers in Latin America and the need to overcome infrasctructure constraints, meaning by these not only the physical barriers to trade, but also the adjustment of the domestic legislative and normative rules in each country. There is clearly a whole agenda of missing actions in this direction. And there is a perception that any advance in this regard is bound to provoke unanticipated stimuli to regional trade.

Third, and as a corollary, there is a need to promote more intensely productive complementarities among countries in the region. Given the marked differences in the economic potential among Latin American countries it is hard to see bright perspectives to regional integration, unless it becomes a 'positive-sum game', where all economic agents identify the benefits of participating in the integration exercise. The Latin American experience has been so far mostly a 'zero-sum game' characterized by bilateral disputes to participate in each other market, instead of joining efforts to face external competition.

Fourth, the perspective of converting regional complementarity into a tool to foster competitiveness implies the need to adopt a 'business only', or at least a 'mostly business' perspective in regional negotiations. As already said, the economic

objectives of a more intense regional trade have recently been less clearly identified than the political reasons governing the negotiations.

Fifth, the Asian example would suggest that there is also a need to stimulate regional FDI aiming at promoting productive complementarity. Several Latin American firms have been increasingly active of lately in their investments abroad. In some cases, this has been supported by national governments as a mechanism to strenghthen domestic groups to operate in non-competitive international markets. One peculiarity of these investment flows has been, however, its 'resource-seeking' characteristic: the more active economic groups in this process operate in sectors with intense utilization of natural resources. The proposal here is for countries to adopt pro-active investment policies also with regard to provide productive complementarity in manufacturing, especially in those sectors where the partitioning of productive stages is becoming a major universal characteristic of their productive process.

Sixth, the financing of productive capacity in smaller economies is an issue in itself. This calls for the availability of regional funds, as well as for a more active presence of multilateral financing institutions. To the extent that this matter is to be dealt with on a regional basis, it raises the issue of the mechanisms to redistribute fiscal revenue, as well as the need for some compensatory mechanisms among the participating countries (both of which, if one recalls the arguments presented in Section II, might affect the regional Terms of Trade).

Seventh, and not least, it is recommended that more oriented comparative research be undertaken, in order to improve the knowledge about the Asian experience. As already mentioned, the usual argument of lack of supply capacity by some countries to justify the structural trade disequilibrium among Latin American countries becomes meaningless when one considers the cases of some Asian economies until recently strongly affected by armed conflicts but which have become dynamic exporters.

In summary, the comparison of the Asian and Latin American recent experiences with regional trade seems to indicate the benefits of a more cohesive and oriented action comprising neighboring countries. A basic condition is that the participating countries identify ex-ante the economic purposes of looking for more integrated trade relations. Once this is achieved the steps to follow become more clearly identifiable. In this sense the Asian experience provides both an example and a stimulus for Latin America.

ANNEXES

Table A.1 - Merchandise Trade as percentage of GDP – 1990-2008					
	1990-99	2000-08		1990-99	2000-08
Latin America			Asia		
Argentina	15.1	32.5	Bangladesh	23.7	38.1
Bolivia	35.4	48.7	China	36.6	54.0
Brazil	13.9	21.9	Hong Kong SAR, China	230.6	303.4
Chile	45.8	60.6	India	16.9	26.8
Colombia	27.0	28.9	Indonesia	49.4	53.0
Costa Rica	64.0	80.0	Japan (	16.0	23.6
Ecuador	42.9	54.0	Korea, Rep. of	52.1	65.8
El Salvador	47.6	60.2	Malaysia	156.7	177.9
Guatemala	35.3	54.7	Mongolia	82.9	101.7
Honduras	89.0	111.6	Pakistan	32.0	32.5
Mexico	44.2	54.0	Philippines	64.3	90.1
Nicaragua	59.9	69.4	Singapore	279.0	324.7
Panama	37.4	35.2	Sri Lanka	65.2	63.8
Paraguay	42.8	67.2	Taiwan, China	75.4	102.6
Peru	23.1	34.9	Thailand	73.6	117.0
Uruguay	27.4	36.9	Vietnam	66.3	126.1
Venezuela, R.B. de	45.1	46.7			

Source: World Bank, World Development Indicators, 2010

Table A.2 - Tariff rate, applied, weighted mean, all products (%)					
	2001	2007		2001	2007
Latin America			Asia		
Argentina	12.5	4.4	Bangladesh (b)	17.9	11.0
Bolivia	9.3	6.2	China	14.1	4.3
Brazil	9.3	5.7	Hong Kong SAR, China	0.0	0.0
Chile	8.7	4.3	India (a)	26.5	6.1
Colombia	10.4	6.8	Indonesia	4.1	3.6
Costa Rica	8.0	1.8	Japan	4.4	2.8
Ecuador (a)	10.8	8.8	Korea, Rep. (d)	10.0	7.1
El Salvador	4.4	3.8	Malaysia	4.3	3.1
Guatemala	10.7	5.9	Mongolia (c)	4.3	5.1
Honduras	6.7	4.4	Pakistan	17.9	11.4
Mexico (a)	6.4	4.6	Philippines	3.9	3.6
Nicaragua	8.8	4.5	Singapore	0.0	0.0
Panama	15.3	1.9	Sri Lanka (e)	6.5	7.1
Paraguay	3.1	3.6	Taiwan, China	3.8	2.0
Peru (b)	6.9	7.0	Thailand (e)	8.3	4.6
Uruguay	10.7	3.3	Vietnam	17.4	10.6
Venezuela, RB (b)	12.8	5.2			

(a) 2002-2007; (b) 2000-2007; (c) 2001-2008; (d) 2005-2007; (e) 2001-2006

Source: World Bank, World Development Indicators, 2010

Table A.3 - Number of documents required for export and import									
	2005	2008	2005	2008		2005	2008	2005	2008
Latin America					Asia				
	Export		Import			Export		Import	
Argentina	9	9	7	7	Bangladesh	6	6	12	8
Bolivia	8	8	7	7	China	6	7	11	6
Brazil	8	8	7	7	Hong Kong SAR, China	6	4	8	4
Chile	6	6	7	7	India	10	8	15	9
Colombia	6	6	11	8	Indonesia	7	5	9	6
Costa Rica	6	6	11	7	Japan	4	4	5	5
Ecuador	10	9	8	7	Korea, Rep.	5	4	8	6
El Salvador	7	8	10	8	Malaysia	7	7	7	7
Guatemala	8	10	7	10	Mongolia	10	8	10	8
Honduras	7	7	11	10	Pakistan	8	9	12	8
Mexico	5	5	5	5	Philippines	8	8	8	8
Nicaragua	6	5	7	5	Singapore	4	4	4	4
Panama	3	3	4	4	Sri Lanka	7	8	12	6
Paraguay	8	8	10	10	Taiwan, China	7	7	7	7
Peru	7	7	8	8	Thailand	9	4	12	3
Uruguay	10	10	10	10	Vietnam	6	6	8	8
Venezuela, RB	8	8	13	9					

Source: World Bank, World Development Indicators, 2010

Table A.4 - Industry: value-added as percentage of GDP					
	1990-99	2000-08		1990-99	2000-08
Latin America			Asia		
Argentina	29.9	32.6	Bangladesh	23.9	26.9
Bolivia	32.0	32.0	China	45.4	46.8
Brazil	32.6	28.2	Hong Kong SAR, China	17.1	10.5
Chile	38.1	41.5	India	26.4	27.7
Colombia	32.6	32.6	Indonesia	41.8	46.0
Costa Rica	30.3	29.5	Japan	35.8	30.5
Ecuador	..	37.7	Korea, Rep.	41.4	37.2
El Salvador	29.5	30.6	Malaysia	42.5	47.7
Guatemala	19.8	29.6	Mongolia	28.7	30.6
Honduras	29.7	30.2	Pakistan	24.4	25.5
Mexico	28.0	32.4	Philippines	32.5	31.8
Nicaragua	27.3	29.4	Singapore	35.1	32.2
Panama	18.0	16.8	Sri Lanka	26.4	28.8
Paraguay	23.8	21.2	Taiwan, China	34.2	27.5
Peru	29.4	33.1	Thailand	39.7	43.4
Uruguay	29.7	25.9	Vietnam	28.9	39.6
Venezuela, RB	49.8	51.7			

Source: World Bank, World Development Indicators, 2010

Table A.5 - Manufactures exports as percentage of merchandise exports					
	1990-99	2000-08		1990-99	2000-08
Latin America			Asia		
Argentina	31.3	30.7	Bangladesh	84.4	91.0
Bolivia	18.6	14.7	China	81.8	91.0
Brazil	54.7	51.9	Hong Kong SAR, China	93.9	91.6
Chile	14.9	14.3	India	74.2	71.4
Colombia	32.0	36.6	Indonesia	47.3	49.3
Costa Rica	34.4	63.9	Japan	95.2	92.0
Ecuador	6.9	9.7	Korea, Rep.	92.5	91.0
El Salvador	43.2	46.4	Malaysia	70.8	74.1
Guatemala	30.0	41.2	Mongolia	14.0	25.2
Honduras	16.5	24.0	Pakistan	82.4	82.3
Mexico	72.5	79.2	Philippines	62.9	88.8
Nicaragua	14.4	11.7	Singapore	80.5	81.2
Panama	17.9	11.2	Sri Lanka	67.5	71.9
Paraguay	15.5	13.2	Taiwan, China	93.5	92.0
Peru	17.8	18.7	Thailand	70.3	75.6
Uruguay	39.4	34.5	Vietnam	44.4	49.9
Venezuela, RB	12.8	9.7			

Source: World Bank, World Development Indicators, 2010

Table A.6 - High-technology exports as percentage of manufactured exports					
	2000	2007		2000	2007
Latin America			Asia		
Argentina	9.1	6.6	Bangladesh	0.2	0.8
Bolivia	40.0	4.7	China	18.6	29.7
Brazil	18.6	11.9	Hong Kong SAR, China	23.3	19.3
Chile	3.4	6.5	India	4.8	5.3
Colombia	7.7	2.9	Indonesia	16.2	10.7
Costa Rica	51.6	45.4	Japan	28.3	19.0
Ecuador	5.6	6.2	Korea, Rep.	34.8	33.4
El Salvador	3.4	4.6	Malaysia	59.5	51.7
Guatemala	7.9	3.5	Mongolia	0.5	7.5
Honduras	0.3	1.2	Pakistan	0.4	1.4
Mexico	22.4	17.1	Philippines	72.6	68.9
Nicaragua	4.9	4.5	Singapore	62.6	46.4
Panama	0.1	0.1	Sri Lanka	2.2	2.1
Paraguay	3.0	7.9	Taiwan, China	43.4	44.8
Peru	3.6	2.1	Thailand	33.3	26.5
Uruguay	2.1	2.9	Vietnam	11.0	8.9
Venezuela, RB	2.8	2.4			

Source: World Bank, World Development Indicators, 2010

Table A.7 - FDI Inflow – Latin America - 1990 - 2008					
Country	**1990-99**	**2000-08**	**Variation**	**FDI as share (%) of GDP**	
	(A)	**(B)**	**(A/B)**	**2004**	**2008**
	Average value (US$ million)		**(%)**		
Argentina	6813	5282	-22%	2.7	2.7
Bolivia	398	367	8%	1.0	3.1
Brazil	10472	23736	127%	2.7	2.9
Chile	3247	7415	128%	7.5	9.9
Colombia	1807	5371	197%	2.7	4.3
Costa Rica	352	1016	189%	4.3	6.8
Ecuador	471	776	65%	2.6	1.8
El Salvador	147	497	238%	2.3	3.5
Guatemala	150	434	188%	1.2	2.1
Honduras	80	519	547%	6.2	6.6
Mexico	8470	22232	162%	3.1	2.0
Nicaragua	111	290	161%	5.6	9.5
Panama	486	1187	144%	7.1	10.4
Paraguay	142	111	-22%	0.5	2.0
Peru	1576	2501	59%	2.3	3.7
Uruguay	116	815	602%	2.4	6.9
Venezuela, R.B. de	116	815	602%	1.3	0.5

Source: World Bank, Trade Division database

Table A.8 - FDI Inflow – Asia - 1990 - 2008					
Country	**1990-99**	**2000-08**	**Variation**	**FDI as share (%) of GDP**	
	(A)	**(B)**	**(A/B)**	**2004**	**2008**
	Average value (US$ million)		**(%)**		
Bangladesh	56	474	749%	0.8	1.4
China	28308	75265	166%	3.1	2.5
Hong Kong SAR, China	19671	37675	92%	20.5	29.3
India	1506	13224	778%	0.8	3.6
Indonesia	2158	2602	21%	0.7	1.6
Japan	2588	8968	247%	0.2	0.5
Korea, Rep. of	2578	4651	80%	1.2	0.8
Malaysia	4131	4502	9%	3.7	3.6
Mongolia	14	219	1443%	5.1	13.0
Pakistan	501	2296	359%	1.1	3.3
Philippines	1188	1583	33%	0.8	0.9
Singapore	8476	18460	118%	18.3	12.5
Sri Lanka	155	346	123%	1.1	1.9
Thailand	3146	6826	117%	3.6	3.7
Vietnam	1338	3077	130%	3.5	8.9

Source: World Bank, Trade Division database

Table A.9 - List of 1919 Products classified as Producer Goods from SITC Rev. 3

SITC-5					
51111	Ethylene	51229	Acyclic alcohols nes	51465	Amino acid derivativ nes
51112	Propylene (propene)	51231	Cyclanic etc alc/derivs	51467	Amino-alc-phenols etc.
51113	Butylenes/butadienes etc	51235	Arom cyc alcohols/derivs	51471	Acyclic amides/compounds
51114	Saturated acyclic hc"s	51241	Phenol pure,its salts	51473	Ureines/derivs/salts
51119	Acyclic hydrocarbons nes	51242	Cresols nes/their salts	51479	Cyclic amides nes/derivs
51121	Cyclohexane	51243	Oth phenols/phenol-alco	51481	Quat ammonium salts,etc
51122	Benzene	51244	Derivatvs of phenol etc	51482	Carboxyimide/amine f cmp
51123	Toluene	51371	Acetic acid/acetates	51483	Acrylonitrile
51124	Xylenes	51372	Esters of acetic acid	51484	Oth nitrile-fnctn cmpnds
51125	Styrene	51373	Methacrylic acid/derivs	51485	Diazo-,azo-,azoxy-cmpnds
51126	Ethylbenzene	51374	Formic acid/salts/esters	51486	Hydrazine etc org derivs
51127	Cumene	51375	Butyric/valeric acid/der	51489	Nitrogen-fnct cmpnds nes
51129	Cyclic hydrocarbons nes	51376	Palmitic/stearic acid/de	51541	Dithiocarbonates
51131	Vinyl chloride	51377	Sat acyc monocarb ac etc	51542	Thiocarbamates
51132	Trichloroethylene	51378	Oleic/linoleic acid etc	51543	Thiuram sulphides
51133	Tetrachloroethylene	51379	Unsat acycl monocarb etc	51544	Methionine
51134	Oth unsat chlor derivs	51381	Maleic anhydride	51549	Organo-sulphur comp nes
51135	Ethylene dichloride	51382	Phthalic anhydride	51550	Oth org-inorg compounds
51136	Oth sat chlor der ac hc	51383	Dioctyl orthophthalates	51561	Lactams
51137	Fl/br/i derivs acycl hc	51384	Dimethyl terephthalate	51562	Coumarins
51138	Multi-halog derivs ac hc	51385	Cyclanic polyacid/derivs	51563	Other lactones
51139	Halog derivs of hc nes	51389	Oth polyacids etc/derivs	51569	Lactams etc nes
51140	Sulphon/nitrat/nitros hc	51391	Lactic/tart/citric acid	51571	N-atom pyrazole ring cmp
51211	Methyl alcohol(methanol)	51392	Alc-func acids/derivs	51572	Hydantoin/derivatives
51212	Propanols	51393	Salacylic acid/derivs	51573	Unf imidazole ring cmpds
51213	Butyl alcohols(butanols)	51394	Phenol-func acids/derivs	51574	Unf pyridime ring cmpds
51214	Octyl alcohols(octanols)	51395	Ket-funct acids/derivs	51575	Quinoline ring compounds
51215	Ethyl alcohol not denat	51396	Oxy-func acids/derivs	51576	Pyrimidine ring compound
51216	Ethyl alc/denatrd spirit	51451	Acyclic monoamines/deriv	51577	N-hetero atom cmpds nes
51217	Fatty alcohols,indust.	51452	Acyclic polyamines/deriv	51578	Phenothiazine ring cmpds
51219	Other monohydric alcohol	51453	Cyclanic amines/derivs	51579	Oth heterocyc cmpds nes
51221	Ethylene glycol	51454	Aromatic monoamine/deriv	51612	Acetals/hemiacetals/derv
51222	Glycerol,glycerol lyes	51455	Aromatic polyamine/deriv	51613	Ethylene oxide(oxirane)
51223	Pentaerythritol	51461	Amino-alcohols/derivativ	51614	Propylene oxide
51224	Mannitol	51462	Amino-phenols/derivative	51615	Other epoxides/derivs
51225	Sorbitol (d-glucitol)	51463	Amino-aldehydes etc.	51616	Aromatic etc ethers/driv
		51464	Lysene/glutamic acid/com	51617	Ether-alcohol/etc/deriv
51621	Acyclic non-oxy f aldeh.	52253	Manganese oxides	52373	Sodium bicarbonate
51622	Oth aldehydes/polymers	52254	Iron oxides/hydroxides	52374	Potassium carbonates
51623	Acetone	52255	Cobalt oxides/hydroxide	52375	Lead carbonates
51624	Ethyl methyl ketone	52256	Titanium oxides	52379	Carbonates of metals nes

51625	Oth acyclic ket non-o fn
51626	Aldehyde derivatives nes
51627	Camphor
51628	Oth cycl non-o-f ketones
51629	Aromatic etc ketones
51631	Phosphoric esters/salts
51639	Oth inorganic esters/etc
51691	Enzymes
51692	Sugars,chem pure etc,nes
51699	Other organic compounds
52210	Carbon nes, carbon black
52221	Gas elements h/n/o/rare
52222	Non-metals se/te/p/as/bo
52223	Silicon
52224	Chlorine
52225	Fluorine,bromine,iodine
52226	Sulphur, pure forms
52227	Mercury
52228	Sodium/potassium metals
52229	Metals ca/sr/ba/r.earth
52231	Hydrochloric acid etc
52232	Sulphuric acid;oleum
52233	Nitric/sulphonitric acid
52234	Phosphoric acids etc
52235	Boric oxide and acid
52236	Oth inorganic acids
52237	Silicon dioxide
52238	Sulphur dioxide
52239	Inorg o-comp non-met nes
52241	Halides of non-metals
52242	Sulphides of non-metals
52251	Zinc oxide,peroxide
52252	Chromium oxides
52257	Lead oxides
52261	Ammonia,anhydrous/solutn
52262	Sodium hydroxide, solid
52263	Sodium hydroxide, solutn
52264	Potassium hydroxide etc.
52265	Oxides etc of mg,sr,ba
52266	Aluminium hydroxide
52267	Artificial corundum
52268	Hydrazine etc./salts
52269	Oth oxides,bases etc nes
52310	Flourides etc
52321	Ammonium chloride
52322	Calcium chloride
52329	Chlorid/brom/iodide nes c
52331	Hypochlorites/h-bromites
52332	Sodium chlorate
52339	Chlorate/brom/iodate nes
52341	Sodium sulphide
52342	Sulphide/polysulphid nes
52343	Dithionite/sulphoxylate
52344	Sulphites/thiosulphates
52345	Sodium sulphates
52349	Oth sulphates/alums
52351	Nitrites of metals
52352	Potassium nitrate
52359	Nitrates of metals
52361	Phosphinate/phosphonates
52362	Triammonium phosphate
52363	Phosphates of metals
52364	Sodium triphosphate
52365	Polyphosphates nes
52371	Ammonium carbonate
52372	Neutral sodium carbonate
52381	Cyanides of metals
52382	Fulminates/cyanates metl
52383	Silicates of metals
52384	Borates/etc of metals
52389	Metal salts inorg ac nes
52431	Salts of metallic acids
52432	Precious metal cmpds et
52491	Hydrogen peroxide
52492	Phosphides of metals
52493	Calcium carbide
52494	Carbides of metals nes
52495	Hydrides/nitrides metals
52499	Other inorg cmpounds nes
52511	Nat uranium/alloy/cmpnds
52513	Enrich uranium/alloy/cmp
52515	Thorium/depl uran/cmpnds
52517	Spent nucl fuel elements
52519	Radioactive elem/cpd nes
52591	Stable isotopes/compound
52595	Rare earth isotop/cmpds
53111	Disperse dyes/preparatns
53112	Acid/mordant dyes/preps
53113	Basic dyes/preparations
53114	Direct dyes/preparations
53115	Vat dyes/preparations
53116	Reactive dyes/preparatns
53117	Synth org pigments/preps
53119	Synthet org col matr nes
53121	Synth brightening agents
53122	Colour lakes
53221	Veg tann extrcts,tannins
53222	Anim/veg coloring matter
53231	Synth org tanning subst
53232	Synth inorg tanning subs
53311	Titanium dioxide pigment
53312	Chrome pigments etc
53313	Cadmium pigments etc.
53314	Ultramarine pigments etc
53315	Zinc sulphide pigmnt etc
53316	Ferro/ferri-cyanide pigm
53317	Inorg colour matrial nes
53318	Inorganic luminophores
53321	Printing ink - black
53329	Printing ink exc black
53341	Polymer paints aqu solut
54147	Nicotine and its salts
54149	Veg alkaloids nes/salts
54151	Insulin and its salts
54152	Pituitary/etc hormone/de
54153	Cortisone/derivatives
54159	Othr hormones/derivs/etc
54161	Glycosides and derivativ
54162	Glands etc and extracts
54163	Antisera/bld fra/vaccine
54164	Blood/toxin/cultures etc
54191	Bandages/plasters/gauze
54192	Blood grouping reagents
56214	Ammonium-calcium nitrate
56215	Calcium cyanamide fert.
56216	Urea (fertilizer)
56217	Urea+ammonium nitrat mix
56219	Chem nitrog fertilzr nes
56221	Basic slag (thomas slag)
56222	Superphosphates
56229	Chem phosph fertilzr nes
56231	Potassium chloride fert.
56232	Potassium sulphate fert.
56239	Chem potass fertilzr nes
56291	Nit-phos-pot fertlzr nes

53342	Polymer paints non-aques
53343	Oth paints/varnishes/etc
53344	Pigments disp non-aq med
53351	Preprd pigment/glaze/etc
53352	Artists colours
53353	Prepared driers
53354	Putty/other fillings etc
53355	Varnish solvents,thinner
54111	Provitamins, unmixed
54112	Vitamin a/derivatives
54113	Vitamin b/derivatives
54114	Vitamin c/derivatives
54115	Vitamin e/derivatives
54116	Vitamins unmixed nes
54117	Provitamin/vitamin mixt.
54131	Penicillins and derivs
54132	Streptomycins and derivs
54133	Tetracyclines and derivs
54139	Other antibiotics(bulk)
54141	Opium alkaoids/derivs
54142	Cinchona alkaloids/deriv
54143	Caffeine and its salts
54144	Ephedrines/salts
54145	Theophylline etc/derivs
54146	Rye ergot alkaloids/driv
54193	X-ray opacifiers
54199	Oth pharmaceutical goods
54211	Penicillin non-retail
54212	Antibiotic nes nonretail
54221	Insulin formulated,bulk
54222	Other hormone non-retail
54231	Alkaloids, non-retail
55131	Essential oils-citrus
55132	Essential oils nes
55133	Resinoids
55135	Essential oil concentrat
55411	Toilet soap in bars etc.
55415	Other soap in bars etc.
55419	Soap in other than bars
55421	Organic detergents
55422	Detergent nes retail pak
55423	Detergent nes non-retail
55431	Leather polishes/creams
55432	Furniture polishes etc.
55433	Coachwork polishes etc.
55434	Scouring piowders/pastes
55435	Glass/metal polishes etc
56211	Ammonium nitrate fert.
56212	Ammonium sulphonitrate f
56213	Ammonium sulphate fert.
56292	Phos-potash fertilizers
56293	Diammonium phosphate fer
56294	Monoammonium phosphate f
56295	Nitrog-phos fertilzr nes
56296	Fertilizers retail packs
56299	Fertilizers nes
57111	Polyethylene sg<0.94
57112	Polyethylene sg>0.94
57120	Ethylene-vinyl acetate
57190	Primary ethylene pol nes
57211	Expansible polystyrene
57219	Other polystyrene
57291	Styrene-acronitrile cpol
57292	Abs copolymer
57299	Styrene polymers nes
57311	Pvc not mixed other subs
57312	Pvc nes non-plasticised
57313	Pvc nes plasticised
57391	Vinyl chlor-acet copolym
57392	Vinyl chloride copol nes
57393	Vinylidene chlor polymer
57394	Fluoro-polymers
57399	Other halo-polymers nes
57411	Polyacetals
57419	Polyethers nes
57420	Epoxide resins
57431	Poycarbonates
57432	Alkyd resins
57433	Polyethylene terephthlat
57434	Unsat polyesters nes
57439	Primary polyesters nes
57511	Polypropylene
57512	Polyisobutylene
57513	Propylene copolymers
57519	Propyl/olefin polym nes
57521	Polymethyl methacrylate
57529	Acrylic polymers nes
57531	Special polyamides
57539	Other polyamides
57541	Urea/thiourea resins
57542	Melamine resins
57543	Amino-resins nes
57544	Phenolic resins
57545	Polyurethanes
57551	Cellulose acetate non-pl
58130	Reinforced plastic pipes
58140	Oth plast pipe w/o fit"g
58150	Oth plast pipe with fitg
58160	Plastic tubes etc nes
58170	Fittings - plastic tubes
58211	Adhes plast film <20cm
58219	Othr adhes plastic film
58221	Ethylene polym film etc
58222	Propylene polym film etc
58223	Styrene polym film etc
58224	Vinyl chloride film etc
58225	Acrylic polymer film etc
58226	Polycarb/etc film etc
58227	Vulcanized rubber film
58228	Cellulose etc film etc
58229	Oth plastic film etc
58291	Cellular plastic sheet
58299	Non-cellular plast sheet
58310	Ethlene polymer rods etc
58320	Vinyl chloride rods etc
59312	Prepared explosives nes
59320	Fuses,primers,detonators
59331	Fireworks
59333	Signal flares/rockets
59721	Anti-knock preparations
59725	Lubricating oil additive
59729	Oil substitute additives
59731	Hydraulic brake fluid
59733	Anti-freezing preps etc
59771	Petro-based leather prep
59772	Petroleum lubricat oils
59773	Textile etc lub non-petr
59774	Lubr oil non-petroleum
59811	Tall oil
59812	Residual wood pulp lyes
59813	Wood oils/turpentine/etc
59814	Rosin/resin acid/oil/der
59818	Wood tar/veg pitch etc
59831	Lignite based waxes
59835	Polyethylene glycol wax

57552	Cellulose acetate plas"d	58390	Oth plastic rods/sticks	59839	Artificial/prepd wax nes
57553	Cellulose nitrates	59211	Wheat starch	59841	Mixed alkylbenzenes nes
57554	Cellulose ethers	59212	Maize (corn) starch	59845	Mixed alkylnaphthalenes
57559	Cellulose/derivs nes	59213	Potato starch	59850	Doped chemicals (electr)
57591	Vinyl acetate polymers	59214	Manioc (cassava) starch	59861	Artificial graphite/etc
57592	Vinyl polymers nes	59215	Starches nes	59863	Prep rubber accelerators
57593	Silicones - primary	59216	Inulin	59864	Activted carbon
57594	Alginic acid,salts,ester	59217	Wheat gluten	59865	Activted nat minrl prods
57595	Natural polymers/derivs	59221	Casein	59867	Culture media,prepared
57596	Petroleum resins etc.	59222	Casein glues/derivs	59869	Compos lab reagents nes
57597	Ion exch polymers	59223	Albumins and derivatives	59881	Ni-based suppt catalysts
57910	Polyethylene wast/scrap	59224	Gelatin and derivatives	59883	Prec.metal supp catalyst
57920	Polystyrene waste/scrap	59225	Peptones/protein derivs	59885	Supported catalysts nes
57930	Polyvinyl chloride wast	59226	Dextrins/modif starches	59889	Catalysts/preps nes
57990	Plastic waste/scrap nes	59227	Dextrin/starch glues	59891	Dye carrier/mordant/etc
58110	Plastic sausage casings	59229	Prepared glue nes retail	59893	Compound plasticizers
58120	Rigid plastic pipes etc	59311	Propellent powders	59894	Fire extinguishr charges
59895	Modelling pastes etc.				
59896	Fluxes/pickling prep/etc				
59897	Cement/etc additives				
59898	Non-refractory mortars				
59899	Oth chem prods,preps,nes				

SITC-6	Description				
61120	Composition leather	62520	Tyres,new,bus or lorry	63520	Cooprage prod,inc staves
61130	Bovine leather < 2.6 m2	62530	Tyres,new for aircraft	63531	Wooden windows/frames
61141	Tanned bov/equin leather	62541	Tyres,new,motorcycles	63532	Wooden doors/frames
61142	Prepd bov/equine leather	62542	Tyres,new,bicycles	63533	Wooden shingles/shakes
61151	Tanned sheep/lamb leathr	62551	Tyres nes,herring-bone	63539	Builders wood nes
61152	Prepd sheep/lamb leather	62559	Tyres nes,other	63541	Wood picture etc frames
61161	Tanned goat/kid leather	62591	Inner tubes	63542	Wood table/kitchen ware
61162	Prepd goat/kid leather	62592	Retreaded tyres	63549	Wood marquetry/carvings
61171	Pigs leather	62593	Used pneumatic tyres	63591	Tools/handles etc wood
61172	Reptile skin leather	62594	Solid/cushion tyres	63599	Other wood articles nes
61179	Animal skin leather nes	62919	Pharmaceut. rubber nes	64110	Newsprint rolls/sheets
61181	Chamois-dressed leather	62921	Conveyor/etc belts "v"	64121	Hand-made paper/board
61183	Leather patent,metalized	62929	Conveyor/etc belts nes	64122	Sensitized paper
61210	Indust leather articles	62991	Hardnd rubber/ebonite	64123	Carbonizing base paper
61220	Harness-makers goods	62992	Uh cell vulc rub article	64124	Wallpaper base
61290	Leather manufactures nes	62999	Uh non-cell rub articles	64125	Paper nes <40g non-mech
61311	Mink skins unassembled	63311	Corks and stoppers	64126	Paper nes 40-150g non-me
61312	Rabbit/hare skins unass.	63319	Cork manufactures nes	64127	Paper nes >150g non-mech
61313	Special lamb skins unass	63321	Agglomerated cork shapes	64129	Paper nes mechanic proc.
61319	Fur skins nes unassemb.	63329	Agglomerated cork nes	64131	Carbon/duplicator paper
61320	Fur skin pieces	63411	Veneer sheets coniferous	64132	Kaolin coated paper<150g
61330	Whole furskins assembled	63412	Veneer sheets non-conif.	64133	Kaolin coated paper>150g

62111	Rubber comp c-black/sil.
62112	Compounded rubber solutn
62119	Rubber material nes
62121	Camel-back retread strip
62129	Rubber profiles nes
62131	Vulc rubber thread/cord
62132	Unhard vulc cell rubber
62133	Unhard vulc rubber nes
62141	Uh rubber tube no fittng
62142	Uh metal-reinf rubr tube
62143	Uh text-reinf rubbr tube
62144	Uh nes-reinf rubber tube
62145	Uh rubber tube + fitting
62510	Tyres new for motor car

63421	Densif wood blocks etc.
63422	Particle board (wood)
63423	Particle board(exc wood)
63431	Plywood-hardwood faced
63439	Plywood-standard
63441	Plywood/lam hard faced
63449	Plywood/laminates nes
63451	Fibreboard dens>0.8g/cm3
63452	Fibreboard dens>0.5g/cm3
63453	Fibreboard dens>.35g/cm3
63459	Fibreboard nes
63491	Hoopwood,split poles etc
63493	Wood wool/wood flour
63511	Wood boxes/drums/cases
63512	Wood pallets etc.

64134	Kaolin coat mech paper
64141	Kraft uncoated unbl bulk
64142	Sack kraft paper in bulk
64146	Kraft uncoat bulk <150g
64147	Kraft uncoat bulk <225g
64148	Kraft uncoat bulk >225g
64151	Semi-chem fluting paper
64152	Sulphite wrap paper,bulk
64153	Greaseproof/transp paper
64154	Multi-ply uncoat paper
64155	Cigarette paper nes
64156	Filter/felt paper
64157	Paper nes uncoated <150g
64158	Paper nes uncoated <225g
64159	Paper nes uncoated >225g

64161	Bulk creped sack kraft
64162	Bulk creped kraft nes
64163	Creped household paper
64164	Bulk corrugated paper
64169	Creped etc paper nes
64171	Plasticized paper >150g
64172	Plasticized paper nes
64173	Bulk tarred paper
64174	Bleached coat kraft<150g
64175	Bleached coat kraft>150g
64176	Kraft paper/board nes
64177	Coated paper etc nes
64178	Gummed/adhesive paper
64179	Bulk paper/board nes
64191	Tar-laminated paper etc.
64192	Composite paper bulk nes
64193	Paper pulp filter blocks
64194	Wallpaper, etc.
64211	Corrugated paper cartons
64212	Folding non-corr cartons
64213	Paper sacks >40cm wide
64214	Paper sacks/bags nes
64215	Paper packing contrs nes
64216	Office files etc-paper
64221	Envelopes
64222	Postcards etc
64223	Boxed stationary etc.
64231	Office books/pads
64233	Binders/folders/files
64234	Manifold business forms

64291	Spools etc of paper etc
64292	Punched card mach cards
64293	Paper plates etc.
64294	Paper tissues,towels etc
64295	Paper etc diapers etc
64299	Other articles of paper
65112	Carded wool yarn in bulk
65113	Combed wool yarn in bulk
65114	Fine hair yarn in bulk
65115	Coarse hair yarn in bulk
65116	Wool etc yarn, retail
65117	Carded wool blend yarn
65118	Combed wool blend yarn
65119	Wool blend yarn, retail
65121	Cotton sewing thrd, bulk
65122	Cotton sewing thr retail
65131	Cotton (>85%)yarn,retail
65132	Cotton yarn nes, retail
65133	Cotton(>85%)yarn bulk
65134	Cotton(<85%)yarn bulk
65141	Synth filament sewing th
65142	Artif filament sewing th
65143	Synth staple sewing thrd
65144	Artif staple sewing thrd
65151	Nylon/polyamide fil yarn
65152	Polyester filament yarn
65159	Synth filament yarn nes
65161	Synth fil yarn retail
65162	Nylon/polyam hi-ten yarn
65163	Single untw syn yarn nes

65176	Multi-fil artif yarn nes
65177	Artif monfil >67 decitex
65181	Syn stap(>85%)yarn retl.
65182	Syn stap(>85%)yarn bulk
65183	Syn stap(<85%)yarn retl.
65184	Syn stap(<85%)yarn bulk
65185	Artif staple yarn retail
65186	Art stap(>85%)yarn bulk
65187	Art stap(<85%)yarn mixt.
65188	Syn monof yarn>67decitex
65191	Metallized textile yarn
65192	Silk yarn non waste,bulk
65193	Silk waste yarn in bulk
65194	Silk yarn for retail
65195	Yarn etc of glass fibre
65196	Flax yarn
65197	Jute etc yarn
65199	Veg fibre yarn nes,paper
65211	Cotton gauze exc narrow
65212	Unblchd cotton terry fab
65213	Woven cotton terry nes
65214	Cotton uncut pile fabric
65215	Cotton cut pile fabric
65221	Woven cottn unbl<200g/m2
65222	Woven cottn unbl>200g/m2
65223	Woven cotton mix<200g/m2
65224	Woven cotton mix>200g/m2
65225	Woven cotton nes<200g/m2
65226	Woven cotton nes>200g/m2
65231	Woven cotton bleach<200g

64239	Book covers/blotters etc	65164	Singl twist syn yarn nes	65232	Woven cotton dyed <200g
64241	Cigarette paper precut	65169	Multi-fil synth yarn nes	65233	Color woven cotton <200g
64242	Copying paper ct to size	65171	Artif filam yarn retail	65234	Woven cotton print <200g
64243	Toilet paper cut to size	65172	Bulk textured artif yarn	65241	Woven cotton bleach>200g
64244	Gummed paper strip,rolls	65173	Bulk hi-ten viscos rayon	65242	Woven cotton dyed >200g
64245	Filter papers etc.	65174	Bulk visco-rayon <120t/m	65243	Woven cotton denim >200g
64248	Printg/writing paper nes	65175	Single artif yarn nes	65244	Color woven cotton >200g
65245	Woven cotton print >200g	65351	Wovn viscose rayon fabrc	65529	Knit/crochet fabric nes
65251	Woven cotn mix blch<200g	65352	Wovn art fil/strip fabrc	65611	Narrow woven pile fabric
65252	Woven cotn mix dyed<200g	65359	Wovn art fil fabric nes	65612	Narrow woven elastic fab
65253	Color woven ctn mix<200g	65360	Wovn art st fibre fabric	65613	Narrow woven fabric nes
65254	Woven cotn mix prnt<200g	65381	Wovn art sf/cotton fabrc	65614	Narrow bonded fabrics
65261	Woven cotn mix blch>200g	65382	Wovn art sf/wool fabrics	65621	Woven textile labels etc
65262	Woven cotn mix dyed>200g	65383	Wovn art sf/manmade fabr	65629	Non-woven text label etc
65263	Woven cotn mix denm>200g	65389	Wovn art sf/other fabric	65631	Gimped yarns
65264	Color wovn cotn mix>200g	65391	Man-made pile fab uncut	65632	Braids/trimmings/etc
65265	Woven cotn mix prnt>200g	65393	Man-made pile fabric nes	65641	Tulles, net fabrics
65291	Blchd wovn cotn nes<200g	65411	Woven noil silk fabric	65642	Mechanical lace
65292	Dyed woven cotn nes<200g	65413	Woven silk >85% fabr nes	65643	Hand-made lace
65293	Color wovn cotn nes<200g	65419	Woven silk fabrics nes	65651	Embroidery,no vis.ground
65294	Print wovn cotn nes<200g	65421	Wovn card wool,fine hair	65659	Embroidery nes
65295	Blchd wovn cotn nes>200g	65422	Wovn comb wool,fine hair	65711	Needleloom/stch bnd felt
65296	Dyed woven cotn nes>200g	65431	Wovn card wool,h/manmade	65712	Felt nes not impregnated
65297	Color wovn cotn nes>200g	65432	Wovn comb wool,h/manmade	65719	Felt impregnated etc
65298	Print wovn cotn nes>200g	65433	Woven card wool,h/other	65720	Non-woven fabrics nes
65311	Wvn hi-ten syn yarn fabr	65434	Woven comb wool,h/other	65731	Gum etc coated textiles
65312	Woven fabr frm strip etc	65435	Wovn pile fab wool/hair	65732	Plastic coated textiles
65313	Bonded syn yarn fabrics	65441	Woven flax fabric >85%	65733	Rubberized textiles nes
65314	Woven polyamide fabr nes	65442	Woven flax fabric <85%	65734	Coated/impreg text. nes
65315	Wovn text.p"estr fab nes	65450	Woven jute etc fabrics	65735	Textile wall coverings
65316	Woven polyester fabr nes	65460	Wovn glass fibre fabric	65740	Quilted textile products
65317	Wovn synth fil fabrc nes	65491	Woven metallized fabric	65751	Twine/cordage/rope/cable
65318	Wovn synth mix fabrc nes	65492	Coarse hair woven fabric	65752	Knotted rope/twine nets
65319	Woven synth fil fab nes	65493	Wovn veg text fibre fabr	65759	Articles of cordage nes
65321	Wovn p"ester s.f. fabric	65494	Woven wide gauze ex cotn	65761	Felt hat bodies/forms ..
65325	Wovn acrylic s.f. fabric	65495	Pile,chenille fabric nes	65762	Hat bodies nes
65329	Wovn synth s.f.fabrc nes	65496	Terry towelling exc cotn	65771	Textile wadding nes etc
65331	Wovn p"ester sf/ctn<170g	65497	Tufted textile fabrics	65772	Textile wicks/mantle etc
65332	Woven other sf/cotn<170g	65511	Long pile knit/croch fab	65773	Industrial textiles nes
65333	Wovn p"ester sf/ctn>170g	65512	Loop pile knit/croch fab	65781	Textile covd rubber cord
65334	Woven other sf/cotn>170g	65519	Knit/croch pile fabr nes	65785	Coated hi-ten synth yarn
65341	Wovn syn fib/wool fabric	65521	Knit/croch fab nes <30cm	65789	Rubber/plasticized t nes
65342	Wovn syn fib/manmade fab	65522	Knit/cr fab >30cm+rubber	65791	Textile hosepiping etc
65343	Wovn syn fib/nes blends	65523	Other fabrics, warp knit	65792	Machinery belts etc,text
65793	Tyre cord fabric	66329	Abrasives other backing	66511	Glass bottles/jars/etc

65811	Jute etc sacks/bags
65812	Cotton sacks/bags
65813	Man-made text sacks/bags
65819	Textile sacks/bags nes
65824	Pneumatic mattresses
65893	Life jacket/belt, etc.
66111	Quicklime
66112	Slaked lime
66113	Hydraulic lime
66121	Cement clinkers
66122	Portland cement
66123	Aluminous cement
66129	Hydraulic cements nes
66131	Flagstones etc,nat stone
66132	Slate,worked,articles
66133	Nat stone tiles <7cm
66134	Marble etc., worked
66135	Building stone unworked
66136	Marble etc finished
66139	Building stone worked
66181	Asphalt etc articles
66182	Mixed veg-mnrl bldg prod
66183	Asbestos/fibre cemnt art
66231	Silice earth bricks etc
66232	Refractry bricks etc
66233	Refractory cement/mortar
66241	N-r bricks/tiles/pipes
66242	Non-ref roof tiles etc.
66243	Piping etc,ceramic
66244	Unglazed ceramic paving
66245	Glazed ceramic paving et
66311	Millstones
66312	Grindstones
66313	Hand sharpening stones
66321	Abrasives cloth backing
66322	Abrasives paper backing
66331	Plaster board/articles
66332	Concrete blocks/tiles
66333	Prefab concrete structre
66334	Concrete articles nes
66335	Mica,worked/articles of
66336	Non-electr graphite arts
66337	Articles of peat
66338	Magnesite/dolomit/chromi
66339	Stone etc articles nes
66351	Slag/rock/mireral wool
66352	Exf vermiculite/exp clay
66353	Minrl insulatng prod nes
66370	Ceramics nes
66381	Asbestos mfs nonfriction
66382	Asbestos manuf-friction
66391	Lab/indus ceram ware nes
66399	Oth ceramic articles nes
66411	Glass in mass/cullet/etc
66412	Glass ball/rod/tube unwk
66431	Drawn/blown tinted glass
66439	Other drawn/blown glass
66441	Non-wired float glass
66442	Wired float glass
66451	Cast/roll glass unwired
66452	Cast,rolled glass wired
66453	Cast,rolled glass profil
66471	Tempered safety glass
66472	Laminated safety glass
66481	Vehicle rear-view mirror
66489	Glass mirrors nes
66491	Edge worked sheet glass
66492	Multi-wall insulat glass
66493	Lamp etc envelopes,glass
66494	Spectacle/clock/.. glass
66495	Glass fibre/wool/prods
66496	Glass bricks/tiles/etc.
66512	Inners for vacuum vessel
66521	Glass-ceramic table ware
66522	Drink glasses non-ceram.
66523	Kitchen/table glass nes
66529	Other glassware nes
66591	Laboratory etc glass
66592	Glass ampoules
66593	Glass ornament/beads/etc
66594	Glass cubes/smallwares
66595	Lighting etc glassware
66599	Other glass articles nes
67121	Pig iron,phosph max 0.5%
67122	Pig iron,phosph exc 0.5%
67123	Alloy pig iron/spiegelei
67131	Iron/steel granules
67132	Iron/steel powders
67133	Pure reduc proc iron
67141	Ferro-manganese>2%carbon
67149	Ferro-manganese<2%carbon
67151	Ferro-silicon alloy
67152	Ferro-silico-manganese
67153	Ferro-chromium alloys
67154	Ferro-silico-chromium
67155	Ferro-nickel alloys
67159	Other ferro-alloys nes
67241	Iron/simple steel ingot
67245	Prim form iron/steel nes
67247	Stnless steel etc ingots
67249	Other alloy steel ingots
67261	Irn,smple steel bars etc
67262	Irn,smple stl plates etc
67269	Irn,smple stl shapes nes
67270	Semi-fin iron/st. >.25%c
67281	Semi-finish stainless
67282	Semi-finish alloy st nes
67311	Coil steel-1 w>600t>4.75
67312	Coil steel-1 w>600t<4.75
67313	Flat steel-1 w>600t>4.00
67314	Flat steel-1 w>600t>4.75
67315	Flat steel-1 w>600t<4.75
67316	Flat steel-1 w 150-600
67317	Flat steel-1 w<600t>4.75
67319	Flat steel-1 w<600 nes
67321	Coil steel-2 w>600t>4.75
67322	Coil steel-2 w>600t<4.75
67412	Zinc el-pl. steel w<600
67413	Zinc coated steel w>600
67414	Zinc coated steel w<600
67421	Tin coated steel w>600
67422	Tin coated steel w<600
67431	Painted etc steel w>600
67432	Painted etc steel w<600
67441	Lead coated/plated steel
67442	Chrome oxide coatd steel
67572	Stnless steel nes w<600
67573	Alloy steel nes w>600
67574	Alloy steel nes w<600
67611	Hrc groove bar/rod ir/st
67612	Hrc free-cut bar steel
67613	Hrc ir/st bar nes c<0.6%
67614	Hrc ir/st bar nes c>0.6%
67615	Hrc stainless steel rods
67617	Hrc hi-speed steel rod

67323	Flat steel-2 w>600t>4.00
67324	Flat steel-2 w>600t>4.75
67325	Flat steel-2 w>600t<4.75
67326	Flat steel-2 w>150t>4.00
67327	Flat steel-2 w<600t>4.75
67329	Flat steel-2 w<600 nes
67331	Coil steel-3 w>600t>3.00
67332	Coil steel-3 w>600t1-3mm
67333	Coil steel-3 w>600t0.5-1
67334	Coil steel-3 w>600t<0.5
67335	Flat steel-3 w>600t<3.00
67336	Flat steel-3 w>600t1-3mm
67337	Flat steel-3 w>600t0.5-1
67338	Flat steel-3 w>600t<0.5
67339	Flat steel-3 w<600mm nes
67341	Coil steel-4 w>600t>3.00
67342	Coil steel-4 w>600t<3.00
67343	Coil steel-4 w>600t0.5-1
67344	Coil steel-4 w>600t<0.55
67345	Flat steel-4 w>600t>3.00
67346	Flat steel-4 w>600t1-3mm
67347	Flat steel-4 w>600t0.5-1
67348	Flat steel-4 w>600t<0.50
67349	Flat steel-4 w<600 nes
67351	Hot roll steel nes w>600
67352	Cold rol steel nes w>600
67353	Rolled steel nes w<600
67411	Zinc el-pl. steel w>600
67701	Railway rails irn/steel
67709	Rlway tr equ nes irn/stl
67811	Wire iron/steel c<0.25%
67812	Wire iron/stl c0.25-0.6%
67813	Wire iron/steel c>0.6%
67821	Stainless steel wire
67829	Alloy steel wire nes
67911	Cast iron tubes/pipes
67912	Iron/stl oil/gas piping
67913	Iron/stl oil drill casng
67914	Ir/n-a stl circ pipe nes
67915	Stless stl circ pipe nes
67916	Alloy-stl circ pipes nes
67917	Ir/st seamless tubes nes
67931	Seamed oil/gas pipeline
67932	Seamed oil/gas dril csng
67933	Welded pipes nes d>406.4
67443	Alumin coatd/platd steel
67444	Coated plated steel nes
67451	Non-ep coat steel w<600
67452	Clad steel plate w<600
67511	Flat si-elec steel w>600
67512	Flat si-elec steel w<600
67521	Flat hispeed steel w>600
67522	Flat hispeed steel w<600
67531	Chr stnless w>600 t>4.75
67532	Chr stnless w>600t3-4.75
67533	Chr stnless w>600 t<3mm
67534	Fhr stnless w>600 t>4.75
67535	Fhr stnless w>600t3-4.75
67536	Fhr stnless w>600 t<3mm
67537	H-r stnless w<600 t>4.75
67538	H-r stnless w<600 t<4.75
67541	Hot-r alloy-st coils>600
67542	Hot-r alloy-st flat >600
67543	Hot-roll alloy-steel<600
67551	C-r stnless w>600 t>4.75
67552	C-r stnless w>600t3-4.75
67553	C-r stnless w>600 t1-3
67554	C-r stnless w>600 t0.5-1
67555	C-r stnless w>600 t<0.5
67556	C-r stnless steel w<600
67561	Cold roll alloy-st w>600
67562	Cold roll alloy-st w<600
67571	Stnless steel nes w>600
68211	Copper unref,exc cement
68212	Copper refined
68213	Master alloys of copper
68214	Copper alloys nes unwrt
68231	Ref copper rod/bar/prof
68232	Copper alloy rod/bar/pro
68241	Refined copper wire
68242	Copper alloy wire
68251	Refined copper sheet etc
68252	Alloy copper sheet etc
68261	Copper foil+backed t<.15
68262	Copper powders,flakes
68271	Copper tubes,pipes,etc
68272	Copper tube fittings
68311	Nickel unwrought
68312	Nickel alloys unwrought
68321	Nickel bars/wire/etc
67619	Hrc alloy-steel nes rod
67621	Hf groove etc ir/st bar
67622	Hf free-cutting st bar
67623	Hf ir/st nes bar c<0.6%
67624	Hf ir/st nes bar c>0.6%
67625	Hf stainless bars nes
67629	Hot form al-st bar nes
67631	C-f free-cut st bars nes
67632	C-f ir/st bar nes c<0.6%
67633	C-f ir/st bar nes c>0.6%
67634	C-f stainless bar nes
67639	C-f alloy-steel bar nes
67641	Hi-speed steel bars nes
67642	Sil-mang steel bars nes
67643	Forged iron/stl bars nes
67644	Alloy steel nes bars nes
67645	Stnless steel bars nes
67646	Forge alloy-st bars nes
67647	Alloy steel bar/rod nes
67648	Hollow drill steel bars
67681	H-f u/i/h/l/t sect h<80
67682	H-f u/i/h/l/t sect h>80
67683	H-f ir/st shape/sect nes
67684	C-f ir/st shape/sect nes
67685	Iron/steel shape/sec nes
67686	Iron/steel sheet piling
67687	Stnless stl etc profile
67688	Other alloy stl profile
68632	Zinc sheet/strip/foil
68633	Zinc powders/dust/flake
68634	Zinc tubes/fittings/etc
68711	Tin not alloyed unwrt
68712	Tin alloys unwrought
68721	Tin bar/rod/wire/profile
68722	Tin sheet/plate/etc t>.2
68723	Tin foil+backed t<.2
68724	Tin tubes/fittings/etc
68911	Tungsten unwrought/waste
68912	Molybdenum unwrght/waste
68913	Tantalum unwrought/waste
68914	Magnesium waste/scrap
68915	Magnesium unwrought
68981	Cobalt mattes/waste
68982	Cadmium unwrought/waste
68983	Titanium unwrought/waste

67939 Seamed pipes nes d>406.4
67941 Seam oil/gas pipelne nes
67942 Seam oil drill casng nes
67943 Seamed circlar pipes nes
67944 Welded non-circ pipe nes
67949 Irn/steel pipes/etc nes
67951 Non-m cast iron pipe fit
67952 Cast ir/st pipe fit nes
67953 Stnless st pipe flanges
67954 Stnls st thread pipe fit
67955 Stnls st but-weld pipe f
67956 Stnls steel pipe fit nes
67959 Ir/st pipe fittings nes
68112 Rolled silver
68113 Silver unwrought
68114 Silver semi-manufacture
68122 Rolled platinum etc
68123 Platinum/alloys unwrght
68124 Oth plat grp metal unwrt
68125 Plat grp metals semi-man
69242 Alu tanks <300l exc gas
69243 Irn/stl comp gas tanks
69244 Aluminium comp gas tanks
69311 Iron/steel ropes/cables
69312 Copper rope/cable non-el
69313 Aluminium ropes/cables
69320 Iron/steel fencing wire
69351 Irn/stl netting/grill
69352 Copper netting/grill/etc
69410 Iron/steel nails etc
69421 Irn/stl nut/bolt/screw
69422 Irn/stl rivet/pin/washer
69431 Copper nail/tack/staple
69432 Copper washers etc
69433 Copper nuts/bolts
69440 Alumin nail/bolt/etc
69510 Hand tools agric/forest
69521 Hand saws
69522 Files/rasps/etc
69523 Pliers,pincers,snips,ets
69530 Wrenches and spanners
69541 Tools drill/thread/tap
69542 Hammers
69543 Planes/chisels/gouges
69544 Screwdrivers

68322 Nickel tube/pipe/etc
68323 Nickel powder/flakes
68324 Nickel plate/sheet/foil
68411 Aluminium not alloyed uw
68412 Aluminium alloys,unwrgh
68421 Aluminium bars/rod/prof.
68422 Aluminium/alloy wire
68423 Alumnm plate/sheet t>0.2
68424 Aluminium foil t<0.2
68425 Aluminium powders/flakes
68426 Aluminium tubes/pipes
68427 Aluminium tube fittings
68511 Unrefined lead/alloys
68512 Refined lead
68521 Lead bar/rod/prof/wire
68522 Lead plate/sheet/strip
68524 Lead tubes/fittings/etc
68611 Zinc not alloyed unwrt
68612 Zinc alloys unwrought
68631 Zinc bar/rod/prof/wire
69562 Carbide tool tips etc
69563 Rock etc drilling tools
69564 Parts to insert in tools
69570 Mixed hand tool sets
69751 Iron/steel sanitary ware
69752 Copper sanitary ware
69911 Locks/keys/clasps/parts
69912 Base metal safes etc
69913 Hinges - base metal
69914 Castors - base metal
69915 Base mtl vehicle fitment
69916 Base mtl building fitmnt
69917 Base mtl furnit fitment
69919 Base mtl bracket/racks
69921 Iron/steel skid chain
69922 Iron/steel chain nes art
69931 Iron/steel needles etc
69932 Iron/steel pins
69933 Base metal buckles etc
69941 Iron,steel springs,etc
69942 Copper springs/leaves
69951 Base mtl flexible tubing
69952 Base mtl bells non-elec
69953 Base mtl stoppers/lids
69954 Base mtl name etc plate

68984 Zirconium unwrt/waste
68991 Beryllium unwrght/waste
68992 Bismuth/articles/waste
68993 Antimony/articles/waste
68994 Manganese/articles/waste
68995 Chromium/articles/waste
68996 Germanium/articles/waste
68997 Bvanadium/articles/waste
68998 Base mtl nes unwrt,waste
68999 Cermets/articles/waste
69111 Iron/st bridges/sections
69112 Iron/st towers/lat masts
69113 Iron/st doors/windows
69114 Iron/st props/scaffold
69119 Irn/steel structure nes
69121 Aluminium doors/windows
69129 Structures,parts alumnm
69211 Iron/steel tanks/vats
69212 Aluminium tanks/vats
69241 Stl tanks <300l exc gas
69978 Tin articles nes
69979 Aluminium articles nes
69981 Cobalt wrt/articles nes
69983 Cadmium wrt/articles nes
69985 Titanium wrt/artics nes
69987 Zirconium wrt/artics nes
69991 Tungsten wrt/artics nes
69992 Molybdenm wrt/artics nes
69993 Tantalum wrt/artics nes
69994 Magnesium wrt/artics nes
69995 Beryllium wrt/artics nes
69999 Base mtls nes wrt/artics

69545	Household tools nes
69546	Hand tools nes
69547	Vices/clamps/etc
69548	Anvil/p.forges/h.grinder
69549	Hand tools sets
69551	Band saw blades
69552	Steel circular saw blade
69553	Circular saw blades nes
69554	Chain saw blades
69555	Straight saw bl for metl
69559	Saw blades nes
69561	Cutting blades for machn
69955	Base mtl solder/weld rod
69961	Iron,steel anchors,part
69962	Non-mal iron casting nes
69963	Iron/steel castings nes
69965	Iron/stl forging nes unw
69967	Irn/stl wire article nes
69969	Irn/steel articles nes
69971	Copper chain/parts
69973	Copper articles nes
69975	Nickel articles nes
69976	Lead articles nes
69977	Zinc articles nes

SITC-7	Description
71111	Steam boilers exc cent-h
71112	Super-heat water boilers
71121	Aux plant for boilers
71122	Steam condensers
71191	Pts nes of boilers 711.1
71192	Pts nes boiler equ 711.2
71211	Steam turbines, marine
71219	Steam turbines, other
71280	Stm turbine(712.1)parts
71311	Aircraft piston engines
71319	Pts nes a/c piston engs
71321	Recip piston engs<1000cc
71322	Recip piston engs>1000cc
71323	Diesel etc engines
71331	Outboard motors
71332	Marine spark-ign eng nes
71333	Marine diesel engines
71381	Spark-ign piston eng nes
71382	Diesel engines nes
71391	Parts nes spark-ign engs
71392	Parts nes diesel engines
71441	Turbo-jets
71449	Reaction engines nes
71481	Turbo-propellers
71489	Other gas turbines nes
71491	Parts nes turbo-jet/prop
71499	Parts nes gas turbines
71610	Electric motors <37.5w
71620	Dc motor(>37w)/generator
71631	Ac,ac/dc motors >37.5w
71632	Ac generators
71640	Electric rotary convertr
71819	Parts nes hydraul turbin
71871	Nuclear reactors
71877	Nuclear fuel elements
71878	Nuclear reactor parts
71891	Linear hydr power engine
71892	Linear pneum.power engin
71893	Other engines,motors nes
71899	Parts nes of engines nes
72111	Ploughs
72112	Seeders/planters/etc
72113	Cultivators/weeders/etc
72118	Oth agric/hortic machnry
72119	Agric machine(7211)parts
72121	Lawn mowers
72122	Combine harvestr-threshr
72123	Oth harv/thresher/mower
72126	Egg/fruit clean/sort mac
72127	Seed clean/sort machinry
72129	Pts nes of machy of 7212
72131	Milking machines
72138	Oth dairy machinery nes
72139	Pts nes dairy machinery
72191	Wine/cider/juice equipmt
72195	Poultry keeping equipmnt
72196	Agric machinery nes
72198	Parts wine/etc machines
72199	Pts nes agric machines
72230	Track-laying tractors
72241	Pedestrian cntrl tractor
72249	Wheeled tractors nes
72311	Bulldozers/angledozers
72312	Graders/levellers-constr
72321	Front-end shovel loaders
72335	Coal/rock/tunnel cutters
72337	Boring/sinking equip nes
72339	Earth handling equip nes
72341	Pile drivers/extractors
72342	Snow ploughs/blowers
72343	Non-sp coal/rock cutters
72344	Non-sp boring machin nes
72345	Non-sp tamping machn nes
72346	Non-self prop scrapers
72347	Non-sp e-m machines nes
72348	Public works machnry nes
72391	E-m bucket/grab/shovels
72392	Bulldozer etc blades
72393	Boring/sink machry parts
72399	Pts nes earth-movg mach
72433	Sewing machines domestic
72435	Sewing machines industrl
72439	Sew mch needles/furn/pts
72441	Textile yarn extruders
72442	Textile fibre proc equip
72443	Yarn spinning/etc equipm
72449	Pts nes textile machines
72451	Weaving machines (looms)
72452	Knitting/stitch bond mac
72453	Gimping/lace/etc machine
72454	Yarn pre-process machine
72455	Felt mfg,finishing machy
72461	Auxil weave/knit machine
72467	Weaving loom parts/acces
72468	Loom/knitter etc pts/acc
72471	Washing machine cap>10kg
72472	Dry-cleaning machines
72473	Drying machines cap>10kg

71651	Gen sets with pistn engs
71652	Generating sets nes
71690	Pts nes motors/generator
71811	Hydr turbine/water wheel
72488	Parts for leather machns
72491	Washing machine parts
72492	Textile machinry pts nes
72511	Cellulose pulp mfg machn
72512	Paper etc making etc mch
72521	Paper/board cutting mach
72523	Paper sack/env manf mach
72525	Paper carton/etc machnry
72527	Paper moulding machinery
72529	Paper ind machines nes
72591	Paper manuf machine pts
72599	Paper product mach parts
72631	Type setting equipment
72635	Printing type,plates,etc
72651	Reel fed offset printers
72655	Sheet fed offset mach a4
72659	Offset print machine nes
72661	Letterpress print machin
72663	Flexographic print mach.
72665	Gravure print machinery
72667	Printing machinery nes
72668	Mach ancillary to printg
72681	Bookbinding machinery
72689	Pts nes of bookbind mchn
72691	Type-setting machn parts
72699	Printing press parts
72711	Cereal/dried legume mach
72719	Cereal/dry legm mach pts
72721	Oil/fat extract machines
72722	Indus food proc mach nes
72729	Indus food proc mach pts
72811	Machine tools - minerals
72812	Machine tools - wood/etc
72819	Pts nes of tools of 7281
72831	Mineral sorting etc mach
72832	Minrl crushing etc machn
72833	Mnrl mixing,kneading mch
73734	Metl resist-weld equ nes
73735	Metal arc welders autom.
73736	Metal arc welders nes
73737	Mtl weld/solder equi nes
72322	Shovel/excavators 360deg
72329	Self prop shovel/exc nes
72331	Earth-moving scrapers
72333	Road rollers/tampers
72834	Minrl moulding etc machn
72839	Pts nes of machy of 7283
72841	Glass/lamp wkng mach nes
72842	Rubber/plastics wrkg mch
72843	Tobacco industry mch nes
72844	Wood/cork presses etc.
72846	Mtal treating machny nes
72847	Isotopic separators
72849	Machnry nes,indiv functn
72851	Glass-working machy part
72852	Plastic/rubber mach part
72853	Tobacco machinery parts
72855	Parts nes, machines 7284
73111	Laser/photon mach tools
73112	Ultrasonic machine tools
73113	Electro-disch mach tools
73114	Electro/plasma mach tool
73121	Metal machining centres
73122	Unit construct machines
73123	Multi-stat transfer mchn
73131	Horiz lathes,num control
73135	Other lathes,num control
73137	Lathes horizontal nes
73139	Lathes,metalworking,nes
73141	Way-type unit head machn
73142	Drilling machs nes num-c
73143	Drilling machines nes
73144	Bore-mill mach nes num-c
73145	Boring-milling machs nes
73146	Boringg machines nes
73151	Mill mach,knee,num-cntrl
73152	Milling mach,knee-t,nes
73153	Milling mach nes num-ctl
73154	Milling machines nes
73157	Threading/tapp machn nes
73161	Flat grinder acc num-ctl
73162	Flat grinder accurat nes
74185	Wood/pulp/paper dryers
74186	Indust driers non-electr
74187	Indust hot food/drink eq
74189	Indust heat/cool equ nes
72474	Oth textile machnery nes
72481	Hide preparation equipmt
72483	Footwear manuf/repair eq
72485	Leather man/repr equ nes
73163	Grinder nes acc num-ctrl
73164	Grinder nes accurate nes
73165	Sharpeners num-control
73166	Sharpening machine nes
73167	Honing/lapping machines
73169	Debur/polish tools nes
73171	Shaping/slotting machine
73173	Broaching machines
73175	Gear-cutting machines
73177	Sawing machs,metalworkng
73178	Planing machs,mtlworking
73179	Mtl-removal m-tools nes
73311	Forging/stamping machine
73312	Bending etc mchs num-ctl
73313	Bending etc machines nes
73314	Shearing etc mch num-ctl
73315	Shearing etc mchines nes
73316	Punching etc mch num-ctl
73317	Punching etc mchines nes
73318	Metal work presses nes
73391	Draw benches mtl bar etc
73393	Metal thread rolling mac
73395	Wire working machines
73399	Metal non-rmvl tools nes
73511	Tool holder/slf-open die
73513	Metal mch-tl work holder
73515	Dividing head/spec atach
73591	Pts nes metal rmvl tools
73595	Pts nes mtl nonrmvl tool
73711	Foundry mould/ladle/etc
73712	Foundry casting machines
73719	Foundry machine parts
73721	Metal rolling mills
73729	Roll-mill pts nes, rolls
73731	Electric soldering irons
73732	Elec braze/solder eq nes
73733	Metl resist-weld eq auto
74412	Fork lift trucks etc nes
74413	Oth handling trucks etc
74414	Elec work trucks no lift
74415	Work trucks nes no lift

73739	Mtl weld/solder eq parts
73741	Hand-held gas welders
73742	Gas oper weld/etc eq nes
73743	Welding machines not gas
73749	Parts gas welders etc.
74121	Furnace burners,liq fuel
74123	Furnace burners nes
74125	Mech stokers/grates/etc
74128	Furnace burner parts
74131	Resist heat furnace/oven
74132	Induct/diel furnace/oven
74133	Furnaces/ovens elect nes
74134	Induct/diel heat equ nes
74135	Elect furnace/oven parts
74136	Ind furnace/oven non-ele
74137	Bakery ovens non-electrc
74138	Ind furn/oven non-el nes
74139	Parts ind non-el furn/ov
74143	Refrigerated display cab
74145	Indust refrig equip nes
74149	Pts nes indus refrig equ
74151	Air-cond window/wall typ
74155	Air-conditioners nes
74159	Air-conditioner parts
74171	Water proc gas generator
74172	Water proc gas gen parts
74173	Gas distill/rectify plnt
74174	Gas heat exchange units
74175	Air/gas liquefying equip
74181	Instant gas water heater
74182	Instant non-e w-heat nes
74183	Medical/lab sterilizers
74184	Agricult drying equipmnt
74531	Indus weighing machines
74532	Personal weighing machns
74539	Weighng mach wts,pts nes
74561	Fire extinguishers
74562	Spray guns etc ry
74563	Steam/sand blasting mach
74564	Agric spraying equipment
74565	Spraying machinery nes
74568	Spraying machinery parts
74591	Rolling mch ex mtl/glass
74593	Rolling machine parts
74595	Automatic vending machs
74190	Parts indus heat/cool eq
74211	Garage-type fuel pumps
74219	Metred liquid pumps nes
74220	Piston eng fuel/wtr pump
74230	Concrete pumps
74240	Reciprocating pumps nes
74250	Rotary pumps nes
74260	Centrifugal pumps nes
74271	Pumps for liquids nes
74275	Liquid elevators
74291	Pump parts
74295	Liquid elevator parts
74311	Vacuum pumps
74313	Hand/foot air pumps
74315	Refrigerator compressors
74317	Mobile air compressors
74319	Pumps/etc nes
74341	Electric room fans <125w
74343	Electric fans nes
74345	Fan cooker hoods <120cm
74351	Centrifug cream separatr
74355	Centrifug clothes drier
74359	Centrifuges nes
74361	Water filters/purifiers
74362	Beverage filter/purifier
74363	Engine oil/petrol filter
74364	Engine air filters
74367	Liquid filters nes
74369	Gas filters nes
74380	Parts for fans/gas pumps
74391	Parts for centrifuges
74395	Parts filters/purifiers
74411	Fork lift truck etc elec
74912	Mould bases
74913	Moulding patterns
74914	Inject/comp moulds metal
74915	Moulds nes metal/carbide
74916	Moulds for glass
74917	Moulds for minerals
74918	Inject/comp mould rubber
74919	Mould nes rubber/plastic
74920	Metal clad gaskets
74991	Ship"s propellers/blades
74999	Mach parts nonelec nes
75113	Auto typewriters/wp mach
74419	Pts nes of work trucks
74421	Pulley tackle/hoists
74423	Pit head winding gear
74425	Capstans/winches nes
74431	O"head tr crane fix supp
74432	Straddle carriers etc
74433	Gantry/bridge/etc cranes
74434	Tower cranes
74435	Portal/pdestal jib crane
74437	Crane mach nes self-prop
74439	Cranes nes not self prop
74441	Garage hoists etc
74443	Jacks/hoists nes hydraul
74449	Vehicle jacks/hoists nes
74471	Pneum elevator/conveyor
74472	Cont action elev/conveyr
74473	Bucket conveyor/elevator
74474	Belt conveyor/elevator
74479	Cont conveyor/elevat nes
74481	Lifts and skip hoists
74485	Escalator,movng walkways
74489	Lift/handle machinry nes
74491	Parts for winches/hoists
74492	Lift truck parts
74493	Lift/skip h/escalat part
74494	Lifting equip parts nes
74511	Pneumatic hand tools
74512	Non-el motor hand tools
74519	Pts nes of tool of 7451
74521	Industrial dish washers
74523	Bottle clean/dry machine
74527	Packing/wrapping mac nes
74529	Packing etc mchy pts nes
75991	Typewrtr parts,acces nes
75993	Dupl/addr mach parts etc
75995	Calculator parts/access.
75997	Adp equip parts/access.
76411	Telephone sets
76413	Teleprinters
76415	Telephone switch equipmt
76417	Telephone line equip nes
76419	Telephone equipment nes
76421	Microphones/stands
76422	Loudspeakers mounted
76423	Loudspeakers unmounted

74597	Automatic vending machs
74610	Ball bearings
74620	Tapered roller bearings
74630	Spherical roller bearing
74640	Needle roller bearings
74650	Cyl roller bearings nes
74680	Ball/roller bearings nes
74691	Bearing ball/needle/roll
74699	Ball etc bearng part nes
74710	Pressure reducing valves
74720	Pneumat/hydraulic valves
74730	Check valves
74740	Safety/relief valves
74780	Taps/cocks/valves nes
74790	Tap/cock/valve parts
74810	Transmission shafts
74821	Ball/roll bearing housng
74822	Bearing housings nes
74831	Iron/stl roller chain
74832	Iron/steel a-l chain nes
74839	Iron,stl a-l chain parts
74840	Gears and gearing
74850	Flywheels/pulleys/etc
74860	Clutches/sh coupling/etc
74911	Foundry moulds etc nes
75115	Elec typewriters <12kg
75116	Electric typewriters nes
75118	Nonelec typewriter <12kg
75119	Nonelec typewriters nes
75121	Electronic calculators
75122	Calculating machines nes
75123	Accounting machines
75124	Cash registers
75128	Postage-franking etc mch
75131	Direct el-stat photocop.
75132	Indir e-stat photocopier
75133	Non-es opt syst photocop
75134	Non-es contact photocop.
75135	Thermo-copying apparatus
75191	Duplicating machines
75192	Addressing machines
75193	Envelope handling machns
75199	Othr office machines nes
75210	Analog/hybrid computers
75220	Digital computers
75230	Digital processing units
75260	Adp peripheral units
75270	Adp storage units
75290	Adp equipment nes
75910	Copy mach parts/access.
76424	Headphones/earphones/etc
76425	Audio freq amplifiers
76426	Elec sound amplifier set
76431	Tv/radio transmitters
76432	Radio transceivers
76481	Radio recep equip nes
76482	Television cameras
76483	Radar apparatus etc
76491	Telephone system parts
76492	Sound reprod equip parts
76493	Telecomm equipmt pts nes
76499	Parts etc of sound equip
77111	Liquid dielec transfrmrs
77119	Other elec transformers
77121	Static converters
77123	Discharge tube ballasts
77125	Inductors nes
77129	Pts nes elec power mach.
77231	Fixed carbon resistors
77232	Fixed resistors nes
77233	Wirewound var resistors
77235	Variable resistors nes
77238	Elect resistor parts
77241	High voltage fuses
77242	Auto circuit breakr<72kv
77243	Other auto circuit brkrs
77244	Hi-volt isolating switch
77245	Limiter/surge prtect etc
77249	Hi-volt equipment nes
77251	Fuses (electrical)
77252	Automatic circuit breakr
77253	Circuit protect equi nes
77254	Relays (electrical)
77255	Other switches
77257	Lamp holders
77258	Plugs and sockets
77259	El connect equ nes<1000v
77261	Switchboards etc <1000v
77262	Switchboards etc >1000v
77281	Switchboards etc unequip
77282	Switchgear parts nes
77311	Winding wire
77312	Co-axial cables
77313	Vehicle etc ignition wir
77314	Elect conductor nes <80v
77581	Elec water heaters
77611	Tv picture tubes colour
77612	Tv picture tubes monochr
77621	Tv camera tubes etc
77623	Cathode-ray tubes nes
77625	Microwave tubes
77627	Electronic tubes nes
77629	Electrnic tube parts nes
77631	Diodes exc photo-diodes
77632	Transistors <1watt
77633	Transistors >1watt
77635	Thyristors/diacs/triacs
77637	Photo-active semi-conds
77639	Semi-conductors nes
77641	Dig monolith integ units
77643	Monolith integ units nes
77645	Hybrid integrat circuits
77649	Integrated circuits nes
77681	Piezo-elec crystals,mntd
77688	Piezo-elec assmbly parts
77848	Hand elec-mech tool part
77861	Fixed power capacitors
77862	Tantalum fixd capacitors
77863	Alum electrolyte capacit
77864	Ceram-diel capacit sngle
77865	Ceram-diel capacit multi
77866	Paper/plastic capacitor
77867	Fixed capacitors nes
77868	Variable/adj capacitors
77869	Electrical capacitr part
77871	Particle accelerators
77878	Special use el equip nes
77879	Parts el equip of 778.7
77881	Electro-magnets/devices
77882	Elec traffic control equ
77883	Elec traffic control pts
77884	Electric alarms etc
77885	Electric alarm parts
77886	Electrical carbons
77889	Elec parts of machy nes

77315 El conductor nes 80-1000
77317 El conductor nes >1000v
77318 Optical fibre cables
77322 Glass electric insulator
77323 Ceramic elect insulators
77324 Other electrc insulators
77326 Ceram elec insul fit nes
77328 Plastic el insul fit nes
77329 Other elec insul fit nes
77411 Electro-cardiographs
77412 Electro-diag equip nes
77413 Ultra-v/infra-red appar.
77421 X-ray apparatus
77422 Alpha/beta/etc ray app.
77423 X-ray tubes
77429 X-ray etc parts/access.
77571 Vac cleaner/floor polish
78439 Other motor vehcl parts
78511 Motorcycles etc i/c<50cc
78513 Motorcycles etc 50-250cc
78515 Motorcycles et 250-500cc
78535 Parts/access motorcycles
78537 Parts,acces cycles etc
78610 Housing/camping trailer
78621 Agric self-load trailers
78622 Tanker trailers/semi-
78629 Other goods trailers
78630 Containers,goods transpt
78683 Trailer/semi-trailer nes
78685 Non-motor vehicles nes
78689 Trailer/semi-trailer pts
79111 Locomotives-ext electric
79115 Locomotives-int electric
79121 Diesel-elect locomotives
79129 Rail locomotive/tend nes
79160 Rail/tram self-prop nes
79170 Rail/tram pass coach etc
79181 Rail/tram service vehics
79182 Rail/tram goods wagons
79191 Rail/air/etc signals/etc
79199 Rail/tram parts nes
79211 Helicopters >2000kg
79215 Helicopters <2000kg
79220 Aircrft nes <2000kg
79230 Aircrft nes 2001-15000kg
77689 Electrnic compon pts nes
77811 Primary batteries/cells
77812 Electric accumulators
77817 Primary batt/cell parts
77819 Elec accumulator parts
77821 Elec filament lamps nes
77822 Elec discharge lamps nes
77823 Sealed beam lamp units
77824 Ultra-v/infra-r/arc lamp
77829 Pts nes of lamps of 7782
77831 Ignition/starting equipm
77833 Ignition/starting parts
77834 Veh elect light/etc equ.
77835 Veh elect light/etc part
77841 Electric drills
77843 Saws (electro-mech hand)
77845 Hand elec-mech tools nes
79311 Inflatable boats
79312 Sailboats nes
79319 Rowing boats/canoes/etc
79322 Tanker ships/boats
79324 Fishing vessels etc
79326 Refrigerated ships/boats
79327 Other cargo ships/boats
79329 Warships, lifeboats
79330 Vessels for breaking up
79351 Dredgers
79355 Float/sub drill/etc plat
79359 Light/fire/crane vessels
79370 Tugs and pusher craft
79391 Inflatable rafts
79399 Floating structures nes
78211 Dumpers, off-highway use
78219 Goods transp vehicle nes
78221 Crane lorries
78223 Mobile drilling derricks
78225 Fire fighting vehicles
78227 Concrete mixer trucks
78229 Special motor vehcls ne
78311 Diesel buses
78319 Buses etc nes
78421 Motor car bodies
78425 Motor vehicle bodies nes
78431 Motor vehicle bumpers
78432 Motor veh body parts nes
78433 Motor vehicle brake/part
78434 Motor vehicle gear boxes
78435 Motor veh drive axle etc
78436 Mot veh non-drive axles

79240	Aircrft nes over 15000kg
79250	Specialcraft/satellites
79281	Gliders/hang gliders
79282	Balloons/dirigibles
79283	Aircraft launchers etc
79291	Aircraft props/rotors
79293	Aircraft under-carriages
79295	Aircraft/helic parts nes
79297	Air/space craft part nes

SITC-8	Description
81211	Radiators, parts thereof
81215	Air heat/distrib equipmt
81217	Central heat boilers n-e
81219	Parts for c-heat boilers
81221	Porc/china plumb fixts
81229	Ceramic plumb fixts nes
81311	Ceiling/wall lamps
81312	Portable battery lamps
81313	Lamps table/desk/etc
81315	Lamps/fittings nes elect
81317	Lamps,fittings non-elect
81320	Illuminated signs etc
81380	Portable lamp parts
81391	Glass lighting parts
81392	Plastic lighting parts
81399	Lighting parts nes
82111	Aircraft seats
82112	Motor vehicle seats
82114	Office type adjust seats
82115	Sofa-beds/chair-beds
82116	Seats nes, wood frames
82117	Seats nes, metal frame
82118	Chairs/seats nes
82119	Parts of chairs/seats
82131	Metal office furniture
82139	Metal furniture nes
82151	Wood office furniture
84812	Leather gloves etc
84822	Rubber gloves
84829	Rubber clothing/acc nes
84844	Safety headgear
84845	Rubber/plastic hats nes
85111	Footw all rub/plast weld
85113	Footw all rub/plast nes
85115	Footwear rub/plast sole
87115	Optical telescopes etc
87119	Binoc/telescope part/acc
87131	Electron/etc diffrac equ
87139	Electron/etc diffr parts
87141	Microscopes stereoscopic
87143	Microscope photo/proj/et
87145	Microscopes nes
87149	Microscopes parts/access
87191	Telescopic sights/etc
87192	Lasers exc laser diodes
87193	Optical instruments nes
87199	Parts/access for 8719
87211	Dental drills
87219	Dental instruments nes
87221	Syringes/catheters/etc
87225	Ophthalmic instruments
87229	Oth medical instruments
87231	M-t/massage/apt test app
87233	Therap respiration appar
87235	Breathing appliances nes
87311	Gas meters
87313	Liquid meters
87315	Electricity meters
87319	Gas/liq/elec meter parts
87321	Counting devices
87325	Speed etc indicators
87329	Meter/counter parts/acc.
87411	Navigation instruments
87412	Navigation inst part/acc
87413	Survey instruments
87414	Survey instr parts/acc.
87422	Drafting/drawing equipmt
87423	Length measuring equipmt
87424	Pts nes of inst of 8742
87425	Measure/check instr nes
87435	Pressure gauges etc
87437	Fluid instruments nes
87439	Fluid instrum parts/acc
87441	Gas/smoke analysis appar
87442	Chromatog/electrophe app
87443	Spectrometers etc
87444	Exposure meters
87445	Optical scient instr nes
87446	Phys/chem analys app nes
87449	Phys/chem anal parts/acc
87451	Balances sensetivity>5cg
87452	Demonstration apparatus
87453	Mechanical testing equip
87454	Mech tester parts/accs
87455	Thermo-/hydro-meters etc
87456	Thermometer etc part/acc
87461	Thermostats
87463	Pressure regulators/etc
87465	Regulate/contrl inst nes
87469	Regul/cntrl inst part/ac
87471	Radiation detectors etc
87473	Oscilloscopes etc
87475	Non-record elect meters
87477	Telecomms test meters
87478	Electrical meters nes
87479	Elec/rad meter parts/acc
88571	Instr panel clocks/etc
88576	Wall clocks electric
88577	Wall clocks non-electric
88594	Time recording apparatus
89394	Plastc office,school equ
89395	Plastc furniture fittngs
89511	Filing cabinet/tray/etc
89512	Bse mtl stationery goods
89521	Pens of all kinds

87111	Binoculars
87426	Meas/check instr part/ac
87431	Liquid flow/level gauges
89522	Pen nibs,nib points
89523	Pencils/crayons/chalks
89591	Writing/drawing ink
89592	Slates for writing
89593	Hand date etc stamps
89594	Typewrtr ribbon,ink pad

Table A.10 - The probable 'Areas of Influence'[104] of each 'Hub' in the two regions

Latin America – Areas of Influence of each 'Hub'		
Brazil	**Argentina**	**Mexico**
Bolivia	Bolivia	Costa Rica
Chile	Chile	El Salvador
Colombia	Colombia	Guatemala
Ecuador	Ecuador	Honduras
Paraguay	Paraguay	Nicaragua
Peru	Peru	Panama
Uruguay	Uruguay	
Venezuela, R.B.	Venezuela, R.B.	

Asia – Areas of Influence of each 'Hub'			
China	**Japan**	**Korea**	**India**
Hong-Kong	Hong-Kong	Hong-Kong	Hong-Kong
Indonesia	Indonesia	Indonesia	Indonesia
Malaysia	Malaysia	Malaysia	Malaysia
Mongolia	Philippines	Philippines	Pakistan
Pakistan	Singapore	Singapore	Singapore
Singapore	Taiwan, China	Taiwan, China	Sri Lanka
Taiwan, China	Thailand	Thailand	Taiwan, Chna
Thailand	Vietnam	Vietnam	Thailand
Vietnam			Vietnam

[104] Defined on the basis of the intensity of total bilateral trade flows

Table A.11 - ASIA – Correlations between trade flows – 1992 - 2006

	ΔXS pgH	ΔXS ogH	ΔMS ogH	ΔMH ogH	ΔMH pgH	ΔXS pgS	ΔXS ogS	ΔXSp gRW	ΔXSo gRW	ΔMSo gRW	ΔXHp gRW	ΔXHo gRW	ΔMH ogRW
ΔXSpgH - exports of producer goods from spokes to hubs		0.951	0.954	0.936	0.924	0.884	0.848	0.673	0.737	0.831	0.681	0.235	0.855
ΔXSogH - exports of other goods from spokes to hubs	0.951		0.917	0.929	0.865	0.808	0.896	0.592	0.756	0.903	0.692	0.259	0.950
ΔMSogH - imports of other goods by spokes from hubs	0.954	0.917		0.927	0.884	0.880	0.925	0.667	0.766	0.894	0.688	0.284	0.839
ΔMHogH - imports of other goods from hubs by hubs	0.936	0.929	0.927		0.868	0.846	0.824	0.586	0.624	0.834	0.582	0.073	0.863
ΔMHpgH - imports of producer goods from hubs by hubs	0.924	0.865	0.884	0.868		0.833	0.749	0.510	0.611	0.692	0.655	0.193	0.753
ΔXSpgS - exports of producer goods from spokes to spokes	0.884	0.808	0.880	0.846	0.833		0.761	0.785	0.637	0.715	0.560	0.057	0.680
ΔXSogS - exports of other goods from spokes to spokes	0.848	0.896	0.925	0.824	0.749	0.761		0.652	0.865	0.974	0.785	0.452	0.888
ΔXSpgRW-exports of producer goods by spokes to ROW	0.673	0.592	0.667	0.586	0.510	0.785	0.652		0.747	0.635	0.682	0.324	0.567
ΔXSogRW - exports of other goods by spokes to ROW	0.737	0.756	0.766	0.624	0.611	0.637	0.865	0.747		0.826	0.935	0.721	0.779
ΔMSogRW-imports of other goods by spokes from ROW	0.831	0.903	0.894	0.834	0.692	0.715	0.974	0.635	0.826		0.722	0.366	0.926
ΔXHpgRW-exports of producer goods by hubs to ROW	0.681	0.692	0.688	0.582	0.655	0.560	0.785	0.682	0.935	0.722		0.773	0.744
ΔXHogRW-exports of other goods by hubs to ROW	0.235	0.259	0.284	0.073	0.193	0.057	0.452	0.324	0.721	0.366	0.773		0.381
ΔMHogRW-imports of other goods by hubs from ROW	0.855	0.950	0.839	0.863	0.753	0.680	0.888	0.567	0.779	0.926	0.744	0.381	

Table A.12 - ASIA – Correlations between trade flows – 1992 – 2008 (Dropping 2007)

	ΔXS pgH	ΔXS ogH	ΔMS ogH	ΔMH ogH	ΔMH pgH	ΔXS pgS	ΔXS ogS	ΔXSp gRW	ΔXSo gRW	ΔMSo gRW	ΔXHp gRW	ΔXHo gRW	ΔMHo gRW
ΔXSpgH - exports of producer goods from spokes to hubs		0.814	0.820	0.884	0.907	0.889	0.745	0.692	0.538	0.597	0.592	0.212	0.612
ΔXSogH - exports of other goods from spokes to hubs	0.814		0.923	0.911	0.815	0.706	0.900	0.495	0.774	0.897	0.707	0.264	0.936
ΔMSogH - imports of other goods by spokes from hubs	0.820	0.923		0.910	0.835	0.776	0.928	0.568	0.781	0.888	0.703	0.287	0.839
ΔMHogH - imports of other goods from hubs by hubs	0.884	0.911	0.910		0.860	0.812	0.817	0.555	0.593	0.772	0.582	0.076	0.794
ΔMHpgH - imports of producer goods from hubs by hubs	0.907	0.815	0.835	0.860		0.826	0.717	0.510	0.527	0.587	0.628	0.189	0.637
ΔXSpgS - exports of producer goods from spokes to spokes	0.889	0.706	0.776	0.812	0.826		0.684	0.795	0.480	0.530	0.495	0.045	0.494
ΔXSogS - exports of other goods from spokes to spokes	0.745	0.900	0.928	0.817	0.717	0.684		0.573	0.857	0.945	0.794	0.453	0.868
ΔXSpgRW-exports of producer goods by spokes to ROW	0.692	0.495	0.568	0.555	0.510	0.795	0.573		0.567	0.450	0.607	0.303	0.387
ΔXSogRW - exports of other goods by spokes to ROW	0.538	0.774	0.781	0.593	0.527	0.480	0.857	0.567		0.858	0.916	0.676	0.821
ΔMSogRW-imports of other goods by spokes from ROW	0.597	0.897	0.888	0.772	0.587	0.530	0.945	0.450	0.858		0.721	0.350	0.941
ΔXHpgRW-exports of producer goods by hubs to ROW	0.592	0.707	0.703	0.582	0.628	0.495	0.794	0.607	0.916	0.721		0.767	0.739
ΔXHogRW-exports of other goods by hubs to ROW	0.212	0.264	0.287	0.076	0.189	0.045	0.453	0.303	0.676	0.350	0.767		0.362
ΔMHogRW-imports of other goods by hubs from ROW	0.612	0.936	0.839	0.794	0.637	0.494	0.868	0.387	0.821	0.941	0.739	0.362	
ΔMHogRW-imports of other goods by hubs from ROW	0.612	0.936	0.839	0.794	0.637	0.494	0.868	0.387	0.821	0.941	0.739	0.362	

Table A.13 - LATIN AMERICA – Correlations between trade flows – 1992 - 2006

	ΔXS pgH	ΔXS ogH	ΔMS ogH	ΔMH ogH	ΔMH pgH	ΔXS pgS	ΔXS ogS	ΔXSp gRW	ΔXSo gRW	ΔMSo gRW	ΔXHp gRW	ΔXHo gRW	ΔMHo gRW
ΔXSpgH - exports of producer goods from spokes to hubs		0.727	0.699	0.706	0.834	0.440	0.471	0.663	0.621	0.779	0.329	0.567	0.754
ΔXSogH - exports of other goods from spokes to hubs	0.727		0.736	0.581	0.754	0.705	0.689	0.750	0.719	0.614	0.601	0.775	0.595
ΔMSogH - imports of other goods by spokes from hubs	0.699	0.736		0.850	0.866	0.654	0.801	0.346	0.618	0.492	0.420	0.657	0.625
ΔMHogH - imports of other goods from hubs by hubs	0.706	0.581	0.850		0.861	0.614	0.699	0.274	0.433	0.520	0.367	0.562	0.502
ΔMHpgH - imports of producer goods from hubs by hubs	0.834	0.754	0.866	0.861		0.658	0.735	0.523	0.653	0.592	0.433	0.618	0.636
ΔXSpgS - exports of producer goods from spokes to spokes	0.440	0.705	0.654	0.614	0.658		0.896	0.210	0.222	0.494	0.314	0.282	0.345
ΔXSogS - exports of other goods from spokes to spokes	0.471	0.689	0.801	0.699	0.735	0.896		0.156	0.428	0.400	0.506	0.416	0.556
ΔXSpgRW-exports of producer goods by spokes to ROW	0.663	0.750	0.346	0.274	0.523	0.210	0.156		0.732	0.614	0.407	0.728	0.469
ΔXSogRW - exports of other goods by spokes to ROW	0.621	0.719	0.618	0.433	0.653	0.222	0.428	0.732		0.413	0.518	0.850	0.586
ΔMSogRW-imports of other goods by spokes from ROW	0.779	0.614	0.492	0.520	0.592	0.494	0.400	0.614	0.413		0.106	0.318	0.508
ΔXHpgRW-exports of producer goods by hubs to ROW	0.329	0.601	0.420	0.367	0.433	0.314	0.506	0.407	0.518	0.106		0.633	0.501
ΔXHogRW-exports of other goods by hubs to ROW	0.567	0.775	0.657	0.562	0.618	0.282	0.416	0.728	0.850	0.318	0.633		0.515
ΔMHogRW-imports of other goods by hubs from ROW	0.754	0.595	0.625	0.502	0.636	0.345	0.556	0.469	0.586	0.508	0.501	0.515	

Table A.14 - LATIN AMERICA – Correlations between trade flows – 1992 – 2008 (Dropping 2007)

	ΔXS pgH	ΔXS ogH	ΔMS ogH	ΔMH ogH	ΔMH pgH	ΔXS pgS	ΔXS ogS	ΔXSp gRW	ΔXSo gRW	ΔMSo gRW	ΔXHp gRW	ΔXHo gRW	ΔMHo gRW
ΔXSpgH - exports of producer goods from spokes to hubs		0.664	0.665	0.697	0.829	0.435	0.465	0.651	0.588	0.777	0.322	0.516	0.659
ΔXSogH - exports of other goods from spokes to hubs	0.664		0.756	0.579	0.726	0.686	0.675	0.588	0.743	0.581	0.403	0.804	0.658
ΔMSogH - imports of other goods by spokes from hubs	0.665	0.756		0.846	0.852	0.652	0.796	0.261	0.644	0.482	0.295	0.685	0.655
ΔMHogH - imports of other goods from hubs by hubs	0.697	0.579	0.846		0.861	0.618	0.702	0.236	0.445	0.519	0.305	0.563	0.498
ΔMHpgH - imports of producer goods from hubs by hubs	0.829	0.726	0.852	0.861		0.660	0.736	0.490	0.646	0.592	0.384	0.600	0.599
ΔXSpgS - exports of producer goods from spokes to spokes	0.435	0.686	0.652	0.618	0.660		0.897	0.182	0.236	0.495	0.265	0.294	0.347
ΔXSogS - exports of other goods from spokes to spokes	0.465	0.675	0.796	0.702	0.736	0.897		0.126	0.436	0.401	0.440	0.422	0.539
ΔXSpgRW-exports of producer goods by spokes to ROW	0.651	0.588	0.261	0.236	0.490	0.182	0.126		0.617	0.589	0.455	0.572	0.298
ΔXSogRW - exports of other goods by spokes to ROW	0.588	0.743	0.644	0.445	0.646	0.236	0.436	0.617		0.404	0.378	0.861	0.625
ΔMSogRW-imports of other goods by spokes from ROW	0.777	0.581	0.482	0.519	0.592	0.495	0.401	0.589	0.404		0.092	0.305	0.466
ΔXHpgRW-exports of producer goods by hubs to ROW	0.322	0.403	0.295	0.305	0.384	0.265	0.440	0.455	0.378	0.092		0.435	0.272
ΔXHogRW-exports of other goods by hubs to ROW	0.516	0.804	0.685	0.563	0.600	0.294	0.422	0.572	0.861	0.305	0.435		0.590
ΔMHogRW-imports of other goods by hubs from ROW	0.659	0.658	0.655	0.498	0.599	0.347	0.539	0.298	0.625	0.466	0.272	0.590	

Table A.15 - Asia and Latin America: Average Gain or Loss (%) in Terms of Trade – 2001 - 2008			
Latin America		**Asia**	
Argentina	3.53	Bangladesh	-12.37
Bolivia	32.03	China	-7.75
Brazil	5.02	Hong Kong SAR, China	-2.04
Chile	33.91	India	0.18
Colombia	11.17	Indonesia	-7.09
Costa Rica	-10.06	Japan	-9.35
Ecuador	5.38	Korea, Rep.	-8.85
El Salvador	-6.10	Malaysia	3.51
Guatemala	1.62	Mongolia	..
Honduras	-9.66	Pakistan	-22.79
Mexico	2.32	Philippines	-7.62
Nicaragua	-9.01	Singapore	..
Panama	4.16	Sri Lanka	5.62
Paraguay	1.93	Taiwan, China	-6.99
Peru	21.60	Thailand	-3.74
Uruguay	2.39	Vietnam	0.17
Venezuela, RB	61.26		

Table A.16 - Asia and Latin America - Grubel-Lloyd Indexes of Producer Goods and Other Goods - 1992-2008

Product	Reporter	Partner	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
ASIA																			
Producer Goods	Hubs (4)	Spokes (12)	0.435	0.409	0.405	0.400	0.456	0.459	0.505	0.540	0.582	0.625	0.621	0.596	0.582	0.569	0.558	0.497	0.472
	Hubs (4)	Rest-of-World	0.387	0.384	0.396	0.415	0.441	0.467	0.455	0.471	0.473	0.464	0.438	0.421	0.395	0.379	0.374	0.362	0.353
	Spokes (12)	Hubs (4)	0.499	0.514	0.516	0.517	0.562	0.585	0.616	0.639	0.649	0.663	0.693	0.713	0.700	0.699	0.707	0.656	0.639
	Spokes (12)	Rest-of-World	0.338	0.338	0.370	0.366	0.375	0.383	0.374	0.383	0.408	0.416	0.412	0.411	0.410	0.421	0.443	0.396	0.416
	Asia (16) **	Asia (16)	0.386	0.392	0.421	0.440	0.464	0.475	0.491	0.505	0.527	0.540	0.542	0.546	0.540	0.551	0.554	0.499	0.494
	Asia (16)	Rest-of-World	0.411	0.404	0.426	0.435	0.450	0.469	0.464	0.475	0.484	0.484	0.464	0.448	0.428	0.422	0.423	0.398	0.400
Other Final Goods	Hubs (4)	Spokes (12)	0.303	0.297	0.316	0.330	0.327	0.306	0.326	0.316	0.327	0.352	0.346	0.343	0.341	0.336	0.318	0.286	0.284
	Hubs (4)	Rest-of-World	0.175	0.184	0.202	0.221	0.221	0.198	0.206	0.177	0.157	0.165	0.162	0.159	0.148	0.134	0.124	0.119	0.112
	Spokes (12)	Hubs (4)	0.389	0.399	0.413	0.424	0.425	0.416	0.421	0.413	0.414	0.442	0.438	0.449	0.454	0.438	0.430	0.427	0.417
	Spokes (12)	Rest-of-World	0.177	0.185	0.189	0.184	0.200	0.195	0.218	0.219	0.193	0.205	0.212	0.208	0.209	0.223	0.253	0.251	0.246
	Asia (16) **	Asia (16)	0.225	0.244	0.252	0.270	0.265	0.267	0.256	0.262	0.268	0.266	0.269	0.286	0.287	0.287	0.298	0.326	0.318
	Asia (16)	Rest-of-World	0.212	0.226	0.243	0.248	0.250	0.229	0.236	0.214	0.195	0.200	0.202	0.198	0.184	0.173	0.171	0.166	0.155
LATIN AMERICA																			
Producer Goods	Hubs (3)	Spokes (14)	0.220	0.246	0.280	0.217	0.243	0.227	0.249	0.261	0.264	0.255	0.230	0.225	0.220	0.221	0.181	0.188	0.181
	Hubs (3)	Rest-of-World	0.435	0.445	0.448	0.450	0.458	0.463	0.485	0.491	0.512	0.496	0.507	0.512	0.508	0.517	0.512	0.502	0.484
	Spokes (14)	Hubs (3)	0.129	0.205	0.216	0.187	0.219	0.236	0.251	0.258	0.260	0.241	0.211	0.213	0.207	0.186	0.155	0.148	0.159
	Spokes (14)	Rest-of-World	0.066	0.068	0.074	0.076	0.085	0.093	0.113	0.129	0.133	0.133	0.138	0.144	0.142	0.148	0.133	0.104	0.098
	LA (17) **	LA (17)	0.188	0.228	0.242	0.278	0.299	0.335	0.363	0.341	0.332	0.326	0.320	0.310	0.291	0.292	0.279	0.283	0.290
	LA (17)	Rest-of-World	0.401	0.404	0.411	0.423	0.432	0.437	0.460	0.472	0.497	0.493	0.506	0.513	0.503	0.509	0.489	0.476	0.454
Other Final Goods	Hubs (3)	Spokes (14)	0.312	0.355	0.405	0.369	0.360	0.371	0.340	0.361	0.385	0.312	0.291	0.272	0.277	0.264	0.238	0.219	0.208
	Hubs (3)	Rest-of-World	0.362	0.333	0.381	0.365	0.335	0.351	0.360	0.349	0.344	0.360	0.346	0.322	0.338	0.325	0.318	0.329	0.328
	Spokes (14)	Hubs (3)	0.204	0.245	0.369	0.324	0.305	0.349	0.311	0.324	0.334	0.299	0.360	0.294	0.306	0.320	0.307	0.231	0.301
	Spokes (14)	Rest-of-World	0.121	0.130	0.102	0.113	0.109	0.116	0.127	0.122	0.114	0.126	0.113	0.102	0.119	0.128	0.099	0.139	0.121
	LA (17) **	LA (17)	0.132	0.171	0.176	0.185	0.178	0.227	0.239	0.225	0.213	0.237	0.199	0.208	0.218	0.216	0.237	0.259	0.245
	LA (17)	Rest-of-World	0.365	0.352	0.348	0.350	0.322	0.349	0.367	0.333	0.319	0.345	0.333	0.308	0.325	0.312	0.290	0.343	0.315

Table … - Trends in Relative Entropy Indexes in Asia and Latin America, 1992-2008

	Relative Entropy Index																
Country	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Based on GDP in Current US Dollar																	
ASIA(16)	0.160	0.146	0.150	0.160	0.176	0.180	0.175	0.171	0.174	0.184	0.192	0.194	0.198	0.209	0.223	0.230	0.230
LA(17)	0.279	0.272	0.290	0.284	0.279	0.280	0.285	0.306	0.298	0.305	0.301	0.295	0.296	0.289	0.284	0.282	0.285
Based on GDP in constant 2000 US Dollar																	
ASIA (16 countries)	0.149	0.153	0.158	0.162	0.165	0.167	0.169	0.172	0.174	0.176	0.179	0.182	0.185	0.188	0.191	0.194	0.197
Latin America (17 countries)	0.293	0.292	0.291	0.296	0.297	0.297	0.298	0.300	0.298	0.300	0.299	0.300	0.301	0.303	0.304	0.304	0.305

Table … - Trends in Herfindahl-Hirschman Indexes of Market Concentration in Asia and Latin America Regions, 1992-2008

	Herfindahl-Hirschman Index																
Region	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Based on GDP in Current Prices																	
ASIA (16)	47	48	46	45	38	36	37	37	37	34	31	30	30	27	25	23	24
LA (17)	22	23	23	26	27	25	25	21	22	22	25	25	24	24	24	24	24
Based on GDP in Constant Prices																	
ASIA (16)	48	46	44	42	41	40	39	38	37	36	35	34	33	32	30	29	29
LA (17)	22	22	22	22	22	22	22	22	22	22	23	23	22	22	22	21	21

Table … - Trends in Intra-Regional Trade Intensity Indexes of Producer Goods and Other Final Goods in Asia and Latin America, 1992-2008

			Trade Intensity Index															
Product	Exporter	Partner	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
ASIA																			
Producer Goods	Asia (16)	Asia (16)	2.244	2.036	2.050	2.045	2.068	2.077	2.229	2.194	2.081	2.198	2.183	2.150	2.088	2.066	2.026	2.079	2.032
	Asia (16)	ROW	2.490	2.086	1.934	1.768	1.770	1.852	2.450	2.209	1.872	1.946	1.745	1.597	1.552	1.560	1.572	1.861	1.912
Other Final Goods	Asia (16)	Asia (16)	1.960	1.871	1.980	2.073	2.278	2.190	2.188	2.067	2.038	2.109	2.142	2.172	2.152	2.054	2.018	2.040	2.046
	Asia (16)	ROW	3.079	3.051	2.899	2.793	2.872	2.889	3.894	3.462	3.120	3.243	3.303	3.179	3.011	2.909	2.958	2.317	2.271
LATIN AMERICA																			
Producer	LA (17)	LA (17)	3.819	3.971	3.730	4.163	3.785	3.393	3.089	2.527	2.392	2.413	2.403	2.802	3.170	3.465	3.480	3.810	3.769

Goods																		
	LA (17)	ROW	14.316	13.161	13.032	14.997	14.305	12.155	12.075	14.473	14.033	14.011	16.692	18.499	17.652	16.345	15.530	14.610	12.386
Other Final Goods	LA (17)	LA (17)	3.625	3.920	3.871	4.113	4.050	3.887	3.852	3.438	3.527	3.767	3.641	3.953	4.096	3.763	3.688	3.860	3.646
	LA (17)	ROW	25.632	22.478	20.542	20.531	20.550	17.995	17.212	20.261	19.567	19.698	22.301	24.596	24.547	23.095	22.503	21.317	20.443

Regression Results: (Sets of hubs with sets of spokes)

Asia

Periods included: 48
Cross-sections included: 15
Total panel (balanced) observations: 720

	Coefficient	Std. Error	t-Statistic	Prob.
C	0.266564	0.602218	0.442637	0.6582
TRADE_PG	-1.545200	0.544311	-2.838820	0.0047
TRADE_OG	1.090689	0.916624	1.189898	0.2345
TINT_P	1.130832	0.499193	2.265322	0.0238
TINT_OG	1.064042	0.717686	1.482602	0.1386

R-squared	0.058597	Mean dependent var	0.300301
Adjusted R-squared	0.053331	S.D. dependent var	0.460456
S.E. of regression	0.448009	Akaike info criterion	1.238915
Sum squared resid	143.5094	Schwarz criterion	1.270716
Log likelihood	-441.0096	Hannan-Quinn criter.	1.251192
F-statistic	11.12621	Durbin-Watson stat	1.614662
Prob(F-statistic)	0.000000		

Latin America

Periods included: 39
Cross-sections included: 15
Total panel (balanced) observations: 585

	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.092150	1.413643	-3.602148	0.0003
TRADE_PG	5.938573	1.090164	5.447414	0.0000
TRADE_OG	-4.150503	1.630431	-2.545648	0.0112
TINT_P	-0.233886	0.919246	-0.254432	0.7993
TINT_OG	6.676564	1.767085	3.778292	0.0002

R-squared	0.098913	Mean dependent var	0.126954
Adjusted R-squared	0.092699	S.D. dependent var	0.514048
S.E. of regression	0.489643	Akaike info criterion	1.418231
Sum squared resid	139.0553	Schwarz criterion	1.455595
Log likelihood	-409.8325	Hannan-Quinn criter.	1.432792
F-statistic	15.91675	Durbin-Watson stat	2.006164
Prob(F-statistic)	0.000000		

Each ‘hub’ individually and all the ‘spokes’ in each region

CHINA

Periods included: 12
Cross-sections included: 15
Total panel (balanced) observations: 180

	Coefficient	Std. Error	t-Statistic	Prob.
C	0.290379	1.267130	0.229163	0.8190
TRADE_PG	-2.555191	1.162536	-2.197946	0.0293
TRADE_OG	1.483615	1.929584	0.768878	0.4430
TINT_P	2.660171	0.712780	3.732107	0.0003
TINT_OG	-0.202248	0.941435	-0.214829	0.8302

R-squared	0.215657	Mean dependent var	0.197785
Adjusted R-squared	0.197729	S.D. dependent var	0.527533
S.E. of regression	0.472509	Akaike info criterion	1.365865
Sum squared resid	39.07135	Schwarz criterion	1.454559
Log likelihood	-117.9279	Hannan-Quinn criter.	1.401827
F-statistic	12.02916	Durbin-Watson stat	1.634262
Prob(F-statistic)	0.000000		

KOREA

Periods included: 12
Cross-sections included: 15
Total panel (balanced) observations: 180

	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.633182	1.158730	-2.272473	0.0243
TRADE_PG	-0.071790	0.995204	-0.072136	0.9426
TRADE_OG	4.969261	1.775135	2.799371	0.0057
TINT_P	0.007800	1.157220	0.006740	0.9946
TINT_OG	9.688163	1.939298	4.995706	0.0000

R-squared	0.186517	Mean dependent var	0.392516
Adjusted R-squared	0.167923	S.D. dependent var	0.451396
S.E. of regression	0.411756	Akaike info criterion	1.090612
Sum squared resid	29.67000	Schwarz criterion	1.179305
Log likelihood	-93.15510	Hannan-Quinn criter.	1.126574
F-statistic	10.03106	Durbin-Watson stat	1.935659
Prob(F-statistic)	0.000000		

JAPAN

Periods included: 12
Cross-sections included: 15
Total panel (balanced) observations: 180

	Coefficient	Std. Error	t-Statistic	Prob.
C	0.260835	1.072875	0.243118	0.8082
TRADE_PG	-3.557370	0.972016	-3.659784	0.0003
TRADE_OG	2.787912	1.625891	1.714698	0.0882
TINT_P	-3.166993	1.095032	-2.892146	0.0043
TINT_OG	9.309368	2.480054	3.753696	0.0002

R-squared	0.135243	Mean dependent var	0.406150
Adjusted R-squared	0.115477	S.D. dependent var	0.423380
S.E. of regression	0.398185	Akaike info criterion	1.023583
Sum squared resid	27.74643	Schwarz criterion	1.112276
Log likelihood	-87.12246	Hannan-Quinn criter.	1.059544
F-statistic	6.842263	Durbin-Watson stat	1.724895
Prob(F-statistic)	0.000039		

INDIA

Periods included: 12
Cross-sections included: 15
Total panel (balanced) observations: 180

	Coefficient	Std. Error	t-Statistic	Prob.
C	2.157440	0.890456	2.422847	0.0164
TRADE_PG	-0.626146	0.803524	-0.779249	0.4369
TRADE_OG	-2.477359	1.347257	-1.838817	0.0676
TINT_P	-7.606985	1.828048	-4.161260	0.0000
TINT_OG	-6.972319	2.208458	-3.157098	0.0019

R-squared	0.287790	Mean dependent var	0.204754
Adjusted R-squared	0.271511	S.D. dependent var	0.388285
S.E. of regression	0.331408	Akaike info criterion	0.656449
Sum squared resid	19.22042	Schwarz criterion	0.745142
Log likelihood	-54.08040	Hannan-Quinn criter.	0.692410
F-statistic	17.67851	Durbin-Watson stat	1.744462
Prob(F-statistic)	0.000000		

ARGENTINA

Periods included: 13
Cross-sections included: 15
Total panel (balanced) observations: 195

	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.896112	2.383256	-3.313162	0.0011
TRADE_PG	4.757375	1.189387	3.999854	0.0001
TRADE_OG	-3.752132	1.669586	-2.247343	0.0258
TINT_P	2.717347	1.572962	1.727535	0.0857
TINT_OG	7.174351	2.987275	2.401637	0.0173

R-squared	0.140639	Mean dependent var	0.277107
Adjusted R-squared	0.122547	S.D. dependent var	0.509089
S.E. of regression	0.476876	Akaike info criterion	1.382185
Sum squared resid	43.20801	Schwarz criterion	1.466109
Log likelihood	-129.7631	Hannan-Quinn criter.	1.416165
F-statistic	7.773610	Durbin-Watson stat	2.129601
Prob(F-statistic)	0.000008		

BRAZIL

Periods included: 13
Cross-sections included: 15
Total panel (balanced) observations: 195

	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.422402	2.712046	-1.261926	0.2085
TRADE_PG	8.320619	5.515172	1.508678	0.1330
TRADE_OG	-6.561961	12.12054	-0.541392	0.5889
TINT_P	-0.878523	1.742192	-0.504263	0.6147
TINT_OG	5.260503	3.297311	1.595392	0.1123

R-squared	0.041199	Mean dependent var	0.138025
Adjusted R-squared	0.021013	S.D. dependent var	0.529666
S.E. of regression	0.524072	Akaike info criterion	1.570930
Sum squared resid	52.18373	Schwarz criterion	1.654853
Log likelihood	-148.1657	Hannan-Quinn criter.	1.604910
F-statistic	2.041023	Durbin-Watson stat	2.294526
Prob(F-statistic)	0.090291		

MEXICO

Periods included: 13
Cross-sections included: 15
Total panel (balanced) observations: 195

	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.216110	2.275083	-0.534534	0.5936
TRADE_PG	-89.38860	27.52015	-3.248115	0.0014
TRADE_OG	55.68916	30.77701	1.809440	0.0720
TINT_P	-4.735264	1.483025	-3.192977	0.0016
TINT_OG	6.624552	2.725668	2.430433	0.0160

R-squared	0.115340	Mean dependent var	-0.034271
Adjusted R-squared	0.096715	S.D. dependent var	0.454787
S.E. of regression	0.432235	Akaike info criterion	1.185612
Sum squared resid	35.49716	Schwarz criterion	1.269535
Log likelihood	-110.5972	Hannan-Quinn criter.	1.219592
F-statlstic	6.192939	Durbin-Watson stat	1.702879
Prob(F-statistic)	0.000105		

Each ‘hub’ and its likely area of influence

China’s zone of influence

COUNTRY="CHN-VNM"
Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.126692	1.546506	-0.081921	0.9348
TRADE_PG	-3.395208	1.428966	-2.375989	0.0190
TRADE_OG	2.791154	2.361643	1.181870	0.2394
TINT_P	2.647987	0.776068	3.412055	0.0009
TINT_OG	-0.013450	1.005800	-0.013372	0.9894

R-squared	0.254566	Mean dependent var	0.227850
Adjusted R-squared	0.231630	S.D. dependent var	0.569643
S.E. of regression	0.499330	Akaike info criterion	1.485236
Sum squared resid	32.41300	Schwarz criterion	1.592839
Log likelihood	-95.25342	Hannan-Quinn criter.	1.528963
F-statlstic	11.09878	Durbin-Watson stat	1.539887
Prob(F-statistic)	0.000000		

Korea's zone of influence

Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.008547	1.279107	-2.352068	0.0202
TRADE_PG	0.134997	1.080901	0.124893	0.9008
TRADE_OG	5.984197	1.964957	3.045459	0.0028
TINT_P	-2.826789	1.173575	-2.408699	0.0174
TINT_OG	6.201011	1.947341	3.184347	0.0018

R-squared	0.103606	Mean dependent var	0.537558
Adjusted R-squared	0.076025	S.D. dependent var	0.402097
S.E. of regression	0.386510	Akaike info criterion	0.973015
Sum squared resid	19.42068	Schwarz criterion	1.080618
Log likelihood	-60.67851	Hannan-Quinn criter.	1.016742
F-statistic	3.756393	Durbin-Watson stat	2.180986
Prob(F-statistic)	0.006322		

Japan's zone of influence

Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.424779	1.244211	-0.341404	0.7334
TRADE_PG	-3.140311	1.124155	-2.793487	0.0060
TRADE_OG	4.039657	1.883207	2.145094	0.0338
TINT_P	-3.930016	1.110391	-3.539309	0.0006
TINT_OG	5.288895	2.699471	1.959234	0.0522

R-squared	0.146974	Mean dependent var	0.481993
Adjusted R-squared	0.120727	S.D. dependent var	0.423754
S.E. of regression	0.397352	Akaike info criterion	1.028344
Sum squared resid	20.52550	Schwarz criterion	1.135947
Log likelihood	-64.41325	Hannan-Quinn criter.	1.072071
F-statlstic	5.599661	Durbin-Watson stat	1.447927
Prob(F-statistic)	0.000344		

India's zone of influence

Periods included: 3
Cross-sections included: 15
Total panel (balanced) observations: 45

	Coefficient	Std. Error	t-Statistic	Prob.
C	4.296379	1.970129	2.180760	0.0351
TRADE_PG	-3.343160	1.766952	-1.892050	0.0657
TRADE_OG	-3.757680	2.962963	-1.268217	0.2121
TINT_P	-25.83187	8.130093	-3.177315	0.0029
TINT_OG	2.794897	19.73733	0.141605	0.8881

R-squared	0.342805	Mean dependent var	0.333946
Adjusted R-squared	0.277086	S.D. dependent var	0.428986
S.E. of regression	0.364743	Akaike info criterion	0.925189
Sum squared resid	5.321487	Schwarz criterion	1.125930
Log likelihood	-15.81676	Hannan-Quinn criter.	1.000023
F-statistic	5.216195	Durbin-Watson stat	0.918973
Prob(F-statistic)	0.001775		

Argentina's zone of influence

Periods included: 4
Cross-sections included: 15
Total panel (balanced) observations: 60

	Coefficient	Std. Error	t-Statistic	Prob.
C	-14.95145	4.302787	-3.474829	0.0010
TRADE_PG	6.337637	1.556842	4.070830	0.0002
TRADE_OG	-4.213359	1.793116	-2.349742	0.0224
TINT_P	6.117726	2.888380	2.118047	0.0387
TINT_OG	12.13183	5.239972	2.315247	0.0244

R-squared	0.322352	Mean dependent var	0.380843
Adjusted R-squared	0.273069	S.D. dependent var	0.543964
S.E. of regression	0.463785	Akaike info criterion	1.380865
Sum squared resid	11.83032	Schwarz criterion	1.555393
Log likelihood	-36.42594	Hannan-Quinn criter.	1.449133
F-statlstic	6.540774	Durbin-Watson stat	0.892513
Prob(F-statistic)	0.000222		

Brazil's zone of influence

Periods included: 5
Cross-sections included: 15
Total panel (balanced) observations: 75

	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.662665	3.872728	-1.978622	0.0518
TRADE_PG	20.31545	7.805140	2.602830	0.0113
TRADE_OG	-26.33989	13.92172	-1.892000	0.0626
TINT_P	3.454440	2.452149	1.408740	0.1633
TINT_OG	5.899823	4.443272	1.327810	0.1886

R-squared	0.104006	Mean dependent var	0.266610
Adjusted R-squared	0.052807	S.D. dependent var	0.435383
S.E. of regression	0.423732	Akaike info criterion	1.184909
Sum squared resid	12.56841	Schwarz criterion	1.339408
Log likelihood	-39.43409	Hannan-Quinn criter.	1.246599
F-statlstic	2.031391	Durbin-Watson stat	0.786699
Prob(F-statistic)	0.099360		

Mexico's zone of influence

Periods included: 9
Cross-sections included: 15
Total panel (balanced) observations: 135

	Coefficient	Std. Error	t-Statistic	Prob.
C	0.899237	2.375724	0.378511	0.7057
TRADE_PG	-112.3270	26.17086	-4.292062	0.0000
TRADE_OG	69.98345	31.73677	2.205122	0.0292
TINT_P	-6.315135	1.579076	-3.999260	0.0001
TINT_OG	5.725647	2.816075	2.033201	0.0441

R-squared	0.202144	Mean dependent var	-0.019519
Adjusted R-squared	0.177595	S.D. dependent var	0.406904
S.E. of regression	0.369007	Akaike info criterion	0.880333
Sum squared resid	17.70162	Schwarz criterion	0.987935
Log likelihood	-54.42244	Hannan-Quinn criter.	0.924059
F-statistic	8.234182	Durbin-Watson stat	1.987327
Prob(F-statistic)	0.000006		